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Survey of Virginia Dental Practices to Determine Compliance With the Standards of Risk Management Theory

Joanne Schade Boyce
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SURVEY OF VIRGINIA DENTAL PRACTICES TO DETERMINE
COMPLIANCE WITH THE STANDARDS OF
RISK MANAGEMENT THEORY

by

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Old Dominion University in Partial Fulfillment
of the Requirements for the Degree of

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~~Approved:~~

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ABSTRACT

SURVEY OF VIRGINIA DENTAL PRACTICES TO DETERMINE COMPLIANCE WITH THE PRINCIPLES OF RISK MANAGEMENT THEORY

Joanne Schade Boyce
Old Dominion University, 1990
Director: Michele L. Darby

The purpose of this survey was to determine selected areas of risk in dental practices within the Commonwealth of Virginia. A self-designed, 51 item questionnaire was sent to a random sample of 300 Virginia dentists to examine their risk management procedures in: 1) the medical record and related documentation, 2) infection control, 3) identification and classification of periodontally involved patients, 4) obtaining informed consent, and 5) emergency protocols. Data from 62% of the dentists were analyzed via the chi-square goodness of fit test, frequency and percentage of responses. Results suggest that Virginia dental practitioners are practicing some of the recommended risk management techniques; however, discrepancies exist between what is recommended and what is being practiced in infection control, documentation and emergency protocols. This study provides a foundation for improving specific areas of dental risk management.

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CHAPTER 1

Introduction

The rise in liability insurance premiums among dental practitioners has led to a growing awareness of the behaviors that contribute to strategies for avoiding malpractice. Commonly reported behaviors that place the practitioner at risk include lack of accurate record keeping, failure to identify and classify periodontally involved patients, failure to implement recommended infection control procedures, nonexistent informed consent, lack of emergency protocols, inadequately credentialed dental staff, and practitioner negligence.^{7,8,44} Risk management is a program of action designed to reduce unplanned or unexpected financial loss to an organization.³² Risk management theory offers strategies to identify and reduce the aforementioned risks that might exist within the dental practice setting, and thus mitigates litigious action taken against the dental health care provider.^{7,8,26,37}

The major purpose of this investigation was to survey the current practice styles of Virginia dentists to determine compliance with the standards of risk management theory. A secondary objective was to sensitize dentists to risk management so that areas of legal vulnerability might

be reduced within the practice setting.

Statement of the Problem

The intent of this investigation was to survey dentists to determine compliance with risk management theory.

Specifically, the following questions were addressed:

1. Are documentation techniques used when reviewing and recording medical/dental histories?
2. Are infection control procedures used to reduce the risk of disease transmission?
3. Is an informed consent to care presented to the patient prior to treatment?
4. Are periodontally involved patients identified and classified?
5. Are emergency protocols established to reduce the risk of a patient fatality?
6. Are office policies and procedures established and employed?
7. Are the demographic variables - age of practitioner, dental specialty, size of practice, and formal education in risk management - significant discriminators when evaluating compliance with the standards of risk management?
8. Are the risk management practices of Virginia dentists comparable to accepted standards of risk management in the current literature?

Significance of the Problem

The medical malpractice crisis of the mid-1970's resulted in as much as a 500% increase in malpractice insurance premiums and, worse, the withdrawal of insurance carriers from malpractice underwriting.²⁶ In response, hospitals and insurance companies took an active interest in risk management strategies to control their losses from litigation.^{45,47} Several states also responded by mandating the establishment of risk management programs within health care facilities to guarantee insurability.^{7,8,44}

In the late 1980's a new malpractice crisis appeared, affecting not only physicians and hospitals but dentists as well. Premiums for dental malpractice insurance and the number of suits brought against dentists rose.⁴⁴ Moreover, since 1985, dollar awards and settlements have increased tenfold.⁴⁴ The American Dental Association (ADA) predicted that within the next year, 10 out of 100 practicing dentists will be confronted with a lawsuit.²⁴ The company that insures most dental practices has been reporting major losses since 1980.^{7,44} These statistics demonstrate the need for implementing risk control measures within dental practices.

Risk management concepts are designed to protect the financial resources of an organization from losses resulting from legal action.^{45,47} An effective dental risk management program includes:

1. loss identification (exposure to legal claims);
2. loss analysis (evaluation of loss experience);
3. loss avoidance or reduction;
4. loss financing (financing claims exposure).³²

Implementing dental risk management standards will reduce the dental practitioner's legal vulnerabilities, mitigate malpractice premiums, protect the reputation and resources of the practitioner, and improve the quality of care rendered to patients.^{7,8} Although the literature abounds with explicit standards for risk prevention, to date no studies examine the dental practitioner's adherence to the standards. By exploring the risk management techniques of practicing dentists, baseline data were generated to help increase awareness of risk management behaviors currently being practiced in the state of Virginia.

As the knowledge level of society about health and disease becomes more sophisticated, the consumer exercises greater selectivity when choosing health care practitioners. Dentistry offers several options such as orthodontic, cosmetic surgery, and cosmetic dentistry to the public who are in pursuit of total wellness and physical attractiveness. Patient dissatisfaction with the dentist and subsequent litigation may occur when the contracted service does not comply with the predicted outcome. The result of patient dissatisfaction can potentially effectuate a malpractice claim against the dentist. Additionally, as the public becomes more cognizant of their health care

options, knowledgeable about their legal rights and critical of the health care received, the dental practitioner's understanding and utilization of risk management behaviors will become financially mandatory. This study provides data from which the practitioner may construct a risk management program to protect his practice from the legally assertive patient.

The general public as well as business and industry are aware of the role of "total wellness" in maintaining a quality life both at home and in the work place. Consequently, the dental practitioner is presented with an array of dental insurance plans, such as fee-for-service reimbursement plans, preferred provider organizations (PPOs), and rapidly growing dental capitation plans, e.g. health maintenance organization (HMOs). Meetz, et al,³⁵ reported that as dental capitation plans increase, the health care system becomes more impersonal, competitive, and cost conscious resulting in increased patient dissatisfaction. Milgrom³⁶ found that patients with third-party insurance usually direct their complaints about the insurance plan to the dental practitioners rather than to the insurance provider. In this situation, patients direct their frustrations to the dentist and continue to be dissatisfied with dental services. The unfortunate result could be the increase in malpractice claims against the dentist. Dryer¹⁸ states that in a five year period, a

typical dental practice loses the majority of its patients to relocation, patient-doctor conflict, or dissatisfaction with the dentist, the staff, or the dental care. Consequently, the typical dental practice has a high patient turnover rate warranting careful documentation strategies and explicit quality control measures. Therefore, dental practitioners need guidance on documentation techniques and establishing baseline data to initiate quality control measures in the practice setting.

When implemented, risk management assumes many aspects of a quality assurance program.³⁷ The mission of a quality assurance program is to improve the quality of patient care and reduce patient injury through patient record audits, review of incident reports, peer reviews, and the evaluation of patient care.^{29,37} Pollack⁴⁴ states that "the major emphasis in any risk management program should be placed on the quality of the care provided by the institution or office." Little data are available to monitor specific aspects of dental care rendered to patients. This study generated data that would enable the dental practitioner to assess quality of care.

Due to the paucity of research performed in the area of dental risk management, there is currently no method available for dental health care providers to compare their risk control measures to those practiced by other dental health care providers. Based upon the results of this

investigation, dental health care providers could evaluate their current dental risk management techniques to identify areas of liability that exist within their practices prior to the threat of a malpractice claim.

The results of the study could be used by many diverse groups including educators, researchers, and dental practitioners, and serve as a foundation for the development of risk management courses and seminars, additional research, and the evaluation of risk management procedures used in dental practices. Hence, this investigation makes significant contributions to the professional literature and to the practice of dentistry.

Definition of Terms

Terms significant to the study are defined as follows:

1. Dental Malpractice - The improper or negligent treatment of a patient by a dentist or dentist's employees, resulting in damage or injury.^{2,47}
2. Risk Management - A formal program of action designed to reduce unplanned or unexpected financial loss to an organization.^{26,32,44}
3. Risk Identification - The systematic means of identifying potential risks were an injury to occur.^{7,8,26,32}
4. Risk Measurement -
The process of applying analytical skills and decision-making techniques to the risk or exposure areas, to ascertain their potential for happening and the financial impact, should

they happen.³²

5. Risk Handling - The management of the identified and measured risk by an organization. The two methods of handling a risk are risk control and risk financing.³²

6. Health History Form - A questionnaire that poses pertinent questions to appraise general health and identify possible precautions or conditions that contraindicate dental treatment. The medical history form can serve as evidence in a court of law.^{16,21}

7. Services Rendered Form - A document which provides accurate and complete information about the care and treatment rendered to patients. This document can serve as evidence in a court of law.^{16,21}

8. Infection Control - The method(s) to prevent the transfer of disease from one person to another.

9. Sterilization - A process by which all forms of bacterial spores and viruses are destroyed.⁶⁴

10. Disinfection - Any process, chemical or physical, by means of which pathogenic agents or disease producing microorganisms can be destroyed.⁶⁴

11. High Risk Patients - The classification of individuals carrying or exposed to highly infectious diseases (e.g., Hepatitis, AIDS).

12. Informed Consent -

.....oral or written consent in which the patient agrees to undergo (dental) procedures during the course of treatment. Information must set out the dangers or side effects inherent in

the (dental) procedures to be followed, and the patient must assume the risk for such treatment. The informed consent should be signed and preserved.³⁷ The informed consent doctrine can serve as evidence in a court of law.

13. Emergency Protocols - A written procedure developed to manage the health status of persons requiring immediate medical attention. This written procedure could serve as evidence in a court of law.

Assumptions

For the purpose of this study, the following assumptions were made:

1. The questionnaire was answered honestly and completely by the respondents.
2. Current risk management techniques used in dental practices were measurable via the self-designed questionnaire.
3. The respondents were aware of the risk management techniques currently used in their dental practices.

Limitations

The following variables might have threatened the validity of the study:

1. The self-designed questionnaire lacks established validity and reliability. Content validity was established by experts on risk management and health law.
2. To minimize the potential of collecting incomplete

data, the respondents were directed to answer all items completely. As a further precaution, the majority of the questions were closed-ended to encourage complete responses to the questionnaire.^{17,43}

3. To minimize misinterpretation of the questions, a pilot study was employed to elicit information on the clarity of the questionnaire. Questions were revised as a result of the pilot study.

4. The potential for a low response rate was minimized by providing respondents with a strong rationale explaining the importance of the survey, using a follow-up letter and questionnaire to non-respondents, and publicizing the study to the Virginia Board of Dentistry and Virginia Dental Association.

5. The potential for superficial or biased responses due to the sensitive issue the questionnaire addressed was minimized by maintaining respondents' anonymity and reporting data in group form only.

6. The results may not reflect the current risk management behaviors due to the fact that dental practitioners are rapidly modifying their practice management styles to accommodate changing standards.

Methodology

The purpose of this study was to determine areas of risk in dental practices within the Commonwealth of

Virginia. All licensed dentists in the Commonwealth of Virginia were eligible as survey respondents. Of the 3800 licensed dentists, 300 were chosen, via simple randomized sampling, to participate in the survey. All participants were sent a packet including a self-designed, 51 item questionnaire, a cover letter, and a stamped, addressed envelop (see Appendices A and B). The questionnaire was pilot-tested to determine content validity and to revise ambiguous items. After approximately two weeks, non-responders were sent a second cover letter, a questionnaire, and a stamped, addressed envelop to achieve an acceptable response rate ($N > 50\%$) (see Appendix C). Responses received after a four week data collection period were included in the study. From a response rate of 62 percent, data obtained from the risk management questionnaire were analyzed via the chi-square goodness of fit test and via frequency and percentage of responses.

CHAPTER 2

Review of the Literature

Literature on recommended risk management techniques in dental and medical environments was reviewed according to the following subject areas: 1) the importance of complete and accurate medical records and documentation strategies, 2) recommended infection control measures, 3) periodontal disease identification and classification, 4) the informed consent doctrine, and 5) dental emergency preparedness.

Importance of Complete and Accurate

Medical Records

The earliest examples of medical record keeping, silhouette drawings depicting the amputations of fingers and the perforation of skulls with surgical tools, can be found on the walls of Spanish caves dating back to 25,000 B.C.¹⁶ In the earlier years, only important cases were documented in detail; the remainder, if recorded, consisted of a line or two and were documented in a log book. Today, it is not uncommon to find medical records containing voluminous documentation on the care of every patient.¹⁶ Unlike the earlier years, the medical record has become consequential to the patient, the treating doctor, the judicial system,

society, and the payer of services.⁴⁴

In the last century, medical record keeping has evolved into a science. A complete, consistent and accurate medical record is the health care provider's best defense against a malpractice claim. In addition to the medicolegal implications, the medical record serves as:

1. a permanent and accurate record of the medical and dental histories and all dental services rendered to the patient, including diagnostic, treatment, consultative, as well as a record of treatment reactions and outcomes;
2. documentation, should information about the condition or treatment of the patient become necessary in legal proceedings;
3. an assessment of the quality of care rendered to the patient;
4. a source of data for research purposes, either formal or to contribute to the experience of the provider;
5. a document in the provision of care as required by third party payers; and
6. a means of communication between health care providers involved in the care of the patient.⁴⁵

Although complete and accurate medical records do not ensure quality dental care, they do provide the opportunity to appraise it, which poor medical records do not.^{21,29} In a court of law, the burden of proof and responsibility is on the dental health care provider to demonstrate an acceptable level of quality through well-documented patient records.²⁹ Several studies have investigated the relationship between the quality of care and the adequacy of medical records.²⁹

The results, although inconclusive, reveal that: 1) a dental health care provider could render excellent patient care while doing a poor job of documentation, 2) it is less likely for a dental health care provider to have exemplary patient records while providing inadequate care,²⁹ and 3) medical records, as they currently exist in private dental offices, for the most part, are inadequate instruments for quality review.²⁹

Documentation Strategies

Accurate record keeping can reduce litigious actions against health care providers.^{7,8,16,21,26,29,32,44,47} The following are salient documentation rules offered by Wade:⁶³

1. Medical records are permanent documents, and as such, all entries should be typewritten or by ballpoint pen. No soft felt pens or lead pencils should be used as recording instruments.
2. Each entry should be documented by date and time, and each medical record page identified by patient name and the date.
3. All entries should be in chronological order and entered on consecutive lines.
4. Each entry should be signed by the individual making the entry. The signature should include the first name initial, complete surname, and status (e.g., R. Brown, R.N.). The signature should follow the completion of the entry.
5. No one should chart or sign the medical record for another individual.
6. Individuals should never countersign an entry without having first read and checked the entry for accuracy. The countersignature attests to the authenticity of what was recorded and shares equal responsibility with the signature being

countersigned.

7. No entry should ever be made in advance of the procedure performed.
8. Medical records must be legible. Printing is preferred with letters of uniform size and words evenly spaced. If an entry cannot be read, it can be argued that what was being documented did not occur.
9. Only [dental]-approved and authorized abbreviations should be used in medical records documentation. Abbreviations should not be used in recording diagnoses, surgical procedures, and medications administered to patients. Abbreviations with duplicate meanings should be avoided.
10. Corrections to a medical record should be few in number and done so carefully and correctly in order that the correction cannot be used by the claimant/plaintiff to cast doubt or suspicion on the reliability and credibility of the record and the one doing the charting. Entries should be corrected only when the entry information is inaccurate. Correction procedures should be as follows:
 - a. A single, thin line should be drawn through each word or line which is inaccurate, but ensuring the incorrect material is still legible.
 - b. The correction should be dated and initialed.
 - c. A note should be placed in the margin stating why the previous entry had to be corrected.
 - d. The correcting entry should be entered on the chart in chronological order, and the charter should assure it is clear which entry is being corrected.
 - e. In questionable situations, the corrected entry should be witnessed by a colleague.
11. Informed consent for surgery and special procedures must be included in the records.

According to Wade⁶³ these documentation rules are

probably more important to claim settlements than the actual services rendered.

Medical Histories Strategies

Pollack⁴⁵ recommends that the patient and the dental practitioner complete the medical history, because the self-administered medical history form leaves too much to chance in discovering medical problems. Many medical history forms require that patients mark a box if they present a particular problem; however, if the patient does not understand the question, the risk of false-negative or incomplete responses increases.^{44,45} Furthermore, if the dental practitioner only reviews the positive responses on the health history form, the probability of finding inaccurate responses decreases.^{44,45} This process, which could lead to major errors, has been a primary cause of malpractice losses.⁴⁵ According to Pollack,⁴⁵ answers to questions on the health history are important to the success and safety of dental care and should not be left to the patient.

Once an accurate and completed health history has been obtained, both the practitioner and patient should sign and date it.⁶³ Both signatures attest to the authenticity of what was recorded.^{45,63} This procedure should be performed prior to initiating any services for the patient.⁴⁵ The potential liability at stake is much more than a legal one.

As Pollack⁴⁵ points out, "when a history of rheumatic fever is not discovered, no matter who is at fault, the consequences to the patient and the dentist may be disastrous." Additionally, good risk management practices require that the patient's health history be updated at short and regular intervals.^{44,45} This process would allow the patient to review the health history obtained at the last history-taking session, then comment on any changes. The practitioner should then make notes in the patient's record, relative to the history taking procedure.^{44,45,63}

Preventive Procedures

Dental treatment, surgical procedures or instrumentation involving mucosal surfaces or contaminated tissue may cause transient bacteremia. Blood-borne bacteria can lodge and infect the heart valves or endocardium that occurs in proximity to congenital or acquired defects, resulting in infective endocarditis or endarteritis.^{61,65} Some conditions that could result in transient bacteremias are as follows:^{61,65}

1. Congenital heart disease; most congenital cardiac malformations.
2. Rheumatic heart disease.
3. Rheumatic fever and other febrile diseases that predispose to valvular damage. As advised by the physician, a functional murmur may not require premedication, whereas an organic murmur that is based on a defect in the structure of the heart does require antibiotic coverage.

4. Prosthetic cardiac valves. Patients with vascular autographs generally do not need antibiotic premedication, whereas those with prosthetic valves are very susceptible to infective endocarditis.
5. Previous history of infective endocarditis.
6. Indwelling transvenous cardiac pacemaker.
7. Mitral valve prolapse with insufficiency.
8. Surgically constructed systemic-pulmonary shunts.

Other indications for prophylactic premedication are:^{61,65}

1. Reduced capacity to resist infection.
 - a. Corticosteroid or other immunosuppressive therapies and disease.
 - b. Anticancer chemotherapy.
 - c. Blood diseases, especially acute leukemia, agranulocytosis, and sickle cell anemia.
2. Uncontrolled, unstable diabetes mellitus.
3. Grossly contaminated traumatic facial injuries and compound fractures.
4. Renal transplant and hemodialysis; glomerulonephritis or other active renal disorders.
5. Prosthetic joint replacements.
6. Coronary bypass surgery within the past six months.

Prophylactic antibiotics are recommended for the aforementioned conditions, and the antibiotics should be initiated shortly before a procedure. The American Heart Association⁶¹ recommends the following antibiotic regimens for dental procedures:

1. Oral penicillin. For adults and children over 60 pounds: Penicillin V 2.0 grams one hour prior to the procedure and then 1.0 gram six hours after initial dose.

2. Oral Erythromycin. Erythromycin 1.0 gram one hour prior to the procedure and then 500 milligrams six hours after initial dose.
3. Cephalexin (Keflex). Two grams orally one hour before procedure, then 1.0 grams six hours later.

Another preventive measure that dental practitioners could perform are blood pressure measurements. Information about the patient's blood pressure can be an effective health service for all ages, as well as essential to formulate special adaptations that may be needed.^{45,65} Because of the potential to increase blood pressure measurements, local anesthetics with vasoconstrictors are contraindicated for use in hypertensive patients.^{45,65} In the case *Germann vs Matriss*²², the dentist administered a local anesthetic with a vasoconstrictor to a hypertensive patient, and the patient suffered a cerebral hemorrhage which was induced by the vasoconstrictor (epinephrine). The dentist was held liable for the patient's death because of his failure to discover the patient's hypertensive condition.

Because the literature reports financial losses for failure to discover,^{7,8,16,21,44,45} through the health history, dental practitioners should use prudent preventive measures such as blood pressure measurements,^{44,45,65} premedication of specific conditions,^{44,45,61,65} and thorough review and documentation of health histories.^{44,45,62,65}

Recommended Infection Control Measures

Compliance with infection control practices by dental practitioners has always been an area of concern; however, it was not until after the first case of a dentist contracting acquired immunodeficiency syndrome (AIDS) that dental practitioners reviewed and updated their infection control protocols.⁶² The threat of contracting AIDS in the dental environment also has aroused the attention of government agencies. As of May 23, 1988, the Occupational Safety and Health Administration (OSHA) has mandated infection control and hazardous material guidelines which will be enforced in all health care treatment facilities with employees, including dental practices and institutions.⁵¹

Public awareness of disease transmission and dental infection control has become extremely sophisticated, particularly as the threat of AIDS - a disease with a 100% mortality rate - receives almost daily exposure in the media.⁵⁶ As a result, patients are assessing their personal risk when visiting their dentist and imposing their own "regulations" on the practitioners by asking them to wear gloves and questioning the methods by which the instruments are sterilized.⁵¹

Although the dreaded consequences of AIDS have been a motivating factor for dental practitioners to comply with OSHA's infection control guidelines, which are derived from

the recommendations of the Centers for Disease Control and the American Dental Association, the fact still remains that dental practitioners are far more at risk of the hepatitis B virus (HBV) than of AIDS.⁵⁵ The Centers for Disease Control report that there are an estimated 500,000 to 1 million infectious carriers of HBV in this country, and that an estimated 200,000 people will become infected with the virus each year. Dental professionals, due to their contact with salivary and blood media which convey the HBV, are five to ten times more likely to contract HBV than the average person.⁴⁹ Additionally, it is reported that the incidence rate of HBV among periodontists, orthodontists, and dental hygienists is more than twice that of a general practitioner, and the incident rate among oral surgeons is more than three times that of a general practitioner.⁴⁹

Due to the ubiquitous and virulent nature of the herpes simplex virus (HSV), the dental practitioner is subjected to another risk of contracting and transmitting a disease.^{49,55} It is estimated that every year in the U.S. there are 98 million cases of herpes labialis and as many as 9 million cases of recurrent genital herpes.^{49,55} Twenty to 30% of the population demonstrates periodic recurrent oral herpetic exacerbations.^{49,55}

Manzella, et al.³⁴ revealed in an epidemiologic investigation that, during a four day period, an ungloved dental hygienist transmitted herpes simplex Type I to 20 of

the 46 patients she treated. At the time the dental hygienist transmitted the virus, there were no noted skin changes; therefore, she was unaware that she had the herpes simplex virus. Additionally, Manzella³⁴ concluded that unless typical vesicular lesions develop, herpes simplex infections may be mistaken for bacterial infections, traumatic injury, or dermatitis.

Worldwide, an estimate of 10 million individuals are carriers of the human immunodeficiency virus (HIV) in more than 100 countries. In the United States, it is estimated that there are about 1.5 to 3 million HIV carriers. In Virginia, 568 residents were reported to have AIDS between January 1982 and November 1987.¹² As for the future, the former U.S. Surgeon General C. Everett Koop stated that in the next five years the number of AIDS cases could increase as much as ninefold.¹

Health care providers are at extremely high risk of contracting infectious diseases due to the invasive procedures that they perform. Due to the increasing number of reported and estimated AIDS cases, the Centers for Disease Control have issued a warning to all health care providers strongly recommending the universal approach to infection control - treating all patients as if they were carriers of an infectious disease.¹⁵ The Centers for Disease Control reported a total of 1,875 health care workers with AIDS. Of the 1,875, 87 were identified as not

being of a high risk group (homosexuals, intravenous drug users, hemophiliacs, and blood transfusion recipients).¹⁴ To this date, 33 of these individuals were interviewed and categorized as follows: five physicians, three of which were surgeons; one dentist; three nurses; nine nursing assistants; seven housekeeping or maintenance workers; three clinical laboratory technicians; one therapist; and four others who did not have contact with patients.¹⁴ Klein³¹ reported that the dentist who tested positive for HIV appeared to have contracted the virus via treating the patient. The dentist was identified as not being of a high risk group; however, it was identified that he routinely did not wear gloves while practicing dentistry.³¹ He did treat patients at risk for AIDS, but did not treat any patients he knew to have the disease.

The Centers for Disease Control identified the following mechanisms by which infectious diseases may be transmitted to dental health care workers (DHCW) within the dental environment:⁵⁵

1. Percutaneous exposure to needles and sharp instruments contaminated with patient material is a significant risk for DHCWs. The risk of acquiring hepatitis B virus (HBV) infection following a needlestick from a hepatitis B carrier ranges from 6 to 30 percent.^{23,56}
2. Non-percutaneous exposures, such as paper nicks, nicks, cuts, scratches, or dermatitis on the exposed hands of DHCWs can provide vascular access of blood or serum from patients to the DHCW. Undetected nicks or cuts have been reported as a mode of disease transmission in other health care workers, although the frequency of occurrence of

these types of cuts in DHCWs is not known.¹

3. The mucous membranes of the eyes, nose, and mouth of the DHCW may be exposed to spattering or splashing of blood and saliva. The efficiency of transmission of saliva is thought to be lower than either blood or serum for HBV, as well as some infectious agents.^{5,6} Three cases reported in a recent Morbidity and Mortality Weekly Report (MMWR) suggest that exposure of skin and mucous membranes to contaminated blood may rarely result in transmission of HIV.¹³
4. Exposure of DHCWs to contaminated environmental surfaces provides an additional mode of transmission. Outbreaks of hepatitis B have been linked to paper cuts on the hands of clerical workers from contaminated patient files.⁴¹ Although this mode of transmission has not been documented in the dental care setting, it is logical to theorize that such a transmission can occur.
5. Exposure to aerosols and spatter generated in the dental environment is yet another potential mode of transmission. Microbiologic studies suggest that blood and saliva are not efficiently aerosolized to produce disease.^{13,42} However, coughing, sneezing, and spatter generated from a dental high-speed handpiece or air-water syringe can generate droplets or spatter, which can pose a health hazard.

Due to the fact that the HIV may live in the human body for years before actual symptoms appear, and the fact that the HBV and HSV may be transmitted before clinical symptoms manifest themselves, the prevention of disease transmission within the dental environment must be state-of-the-art. The Centers for Disease Control and the American Dental Association state that the risk of disease transmission can be greatly minimized, if not eliminated, if the following measures are applied:⁵⁵

1. DHCWs must routinely wear gloves for all patient

contacts. The efficiency of gloves as a barrier technique has been demonstrated by the dramatic reduction of HBV and herpes transmission by DHCWs.

2. Immunization against HBV is recommended for DHCWs, preferably early in their careers. Because of the sequelae of transmission, appropriate measures should be taken to prevent perinatal exposure of HBV in female DHCWs and the spouses of male DHCWs.
3. Barrier protection of mucous membranes of the eyes, nose, and mouth (i.e., eyewear, masks, or protective shields) must be employed by the DHCW to protect against transmission of disease from spattering or splashing.
4. Care must be exercised in handling contaminated needles and other sharp instruments. Inappropriate handling of needles, such as bending, cutting, or recapping by hand must be avoided to prevent needlestick injuries and the potential risk of disease transmission.
5. Understanding the distinction between the terms "disinfection," "sterilization," and "cold sterilization" is important in determining appropriate and necessary processing of contaminated items. Appropriate disinfection/sterilization procedures should be employed on dental instruments and environmental surfaces where contamination by the patient is likely to occur.
6. Contaminated dental equipment used in the provision of care should be appropriately decontaminated. Significant microbial contamination can exist within water lines of many dental units, which supply the air-water syringe, high-speed dental handpieces, and other devices, such as ultrasonic scalers. Following the treatment of patients, as much as 0.9 ml of fluid can be retracted from the end of the handpiece into the handpiece and water lines. Although the magnitude of risk for disease transmission has not been adequately quantified, the bacterial contamination would likely represent a greater risk to the patient than the DHCW. Reduction of bacteria in the handpiece and water lines can be achieved by flushing water through the equipment for several minutes at the beginning of the clinic day and between treatment of patients.

7. Proper disposal of waste and sharp items, and consideration of environmental risk factors must be incorporated into an infection control program. To eliminate potential problems within the dental care environment, dental waste can be considered similar to hospital waste, and should be routinely disposed of in a plastic bag that is tightly bound. Contaminated sharp items should be disposed of in a puncture-resistant container, so that individuals who dispose of waste are not injured.

Recommendations will continue to change as new data quantifying the risks and hazards for the oral health care worker evolve. Additionally, the federal government and other agencies outside the field of dentistry will invoke stricter infection control mandates, requiring full compliance by all health care workers. Therefore, to maintain the standard of care, dental professionals consistently must use current infection control protocols and implement new recommendations to reduce risks in the practice setting.

Periodontal Disease Identification and Classification

Before 1972, the phrase periodontal disease did not appear in any federal or state dental malpractice case;⁵³ however, since 1977, the number of lawsuits based on the failure to diagnose or treat periodontal disease has steadily increased.⁴ Today, it is readily acknowledged by the dental and legal professions that failure to diagnose and treat periodontal disease is one of the leading causes of dental malpractice.⁴

The rise in the number of cases based on the failure to diagnose or treat periodontal disease could be attributed to the increased awareness among the public of proper oral hygiene methods and dental therapeutics.⁴ Also, the combination of adverse periodontal problems and inadequate records has had the effect of focusing blame on dental professionals.

Approximately 75 percent of the adult patient population has periodontal disease;³⁹ therefore, an understanding of the legal principles, adequate record keeping, and the standard of care is essential for the mutual protection of the patient and the dental professional.^{4,44} Of these, record keeping, specifically periodontal classification and charting, could prove to be the most valuable defense in the court of law.^{4,39,44}

Periodontal diseases can be documented in a variety of ways by the oral health care practitioner. For example, Suzuki⁶⁰ offers the following suggestions to classify periodontal involvement:

1. Gingivitis - is an inflammatory process affecting the soft tissues surrounding the teeth. The inflammatory process does not extend into the alveolar bone, periodontal ligament, or cementum. The primary etiologic agent of gingivitis is bacterial plaque.

The following are forms of gingivitis:

- a. Plaque - associated with gingivitis
 - b. Acute necrotizing ulcerative gingivitis (ANUG)
 - c. Steroid hormone-influenced gingivitis
 - d. Medication-influenced gingival overgrowth
 - e. Other forms of gingivitis (e.g. nutritional deprivation)
2. Periodontitis - is defined as inflammation involving the gingival unit (gingiva and alveolar mucosa) and extends to the periodontal ligament, alveolar bone, and cementum. Periodontitis involves loss of clinical attachment and radiographic loss of bone. The conversion clinically from gingivitis to periodontitis reflects the progression, histopathologically, from the established stage to the advanced stage of the periodontal lesion. The reasons for this progression remain unclear but may reflect aberrations of host cell responsiveness to plaque infection or may represent colonization and infection by highly pathogenic plaque bacteria.

The following are various forms of periodontitis:

- a. Adult periodontitis
- b. Rapidly progressive periodontitis - Type A
- c. Rapidly progressive periodontitis - Type B

- d. Juvenile periodontitis
- e. Postjuvenile periodontitis
- f. Prepubertal periodontitis

The presence and intensiveness of periodontal disease could be documented by periodontal indices, such as the Periodontal Disease Index (PDI) and the Periodontal Index.

Another classification that practitioners could use in their practices is the system proposed by the American Dental Association and American Academy of Periodontology:⁶⁴

- 1. Case Type I: Gingivitis
3 mm or less
- 2. Case Type II: Early periodontitis
4-5 mm pockets
- 3. Case Type III: Moderate periodontitis
6-7 mm pockets
- 4. Case Type IV: Advanced periodontitis
8 mm or greater

According to Woodall⁶⁷ detailed periodontal charting provides information necessary to establish a diagnosis of the patient's condition and serves as a resource for treatment planning. To provide the current standard of care and to prevent litigation, complete periodontal charting is required: probing, bleeding points, recession, furcation, mobility, occlusal screening, and tooth examination (e.g. caries, listing restorations). When periodontal disease is active, the migration of the epithelial attachment along the cemental surface will continue; therefore, the periodontal

probe measurements are critical when recording baseline data that describes the patient's gingival status. The presence of sulcular bleeding can be detected during periodontal probing. It can be an indication of gingival inflammation and disease activity. Bleeding points are easily recorded on the chart by placing a red dot where the bleeding was noted.^{39,64,67} Gingival recession measurements, which are the recorded heights at the gingival margin, are necessary in determining the gain and loss of attachment.^{39,67} The more common way of depicting gingival height is to draw a line representing the height of the gingival margin in the dental record. This recording along with periodontal pocket readings give the clinician a graphic illustration of the status of the periodontal structures.

As a result of periodontal disease and bone loss, the presence of exposed root furcations exists. The following criteria should be used to classify the extent of destruction:

- Class I = The explorer or probe can detect the concavity of the furcation but cannot enter it. This amount of involvement cannot be detected radiographically.
- Class II = The explorer or probe can enter the furcation areas but not extend through to the opposite side. A slight radiolucency in the furcation area may be detected with this amount of involvement.
- Class III = The explorer or probe can pass all the way through the furcation to the opposite side. An obvious radiolucency should be visible showing the total destruction of bone in the furcation area.⁶⁷

The appropriate Roman numeral should be placed in the dental record identifying the picture of the affected tooth in the area of the furcation.^{64,67}

By recording the mobility of all teeth, the degree of bone destruction and loss of periodontal support can be documented. The following criteria should be used to chart the degree of mobility:^{64,67}

- N = normal, physiologic
- 1 = slight mobility, greater than normal
- 2 = moderate mobility, greater than 1 mm, displacement
- 3 = severe mobility, may move in all directions, vertical as well as horizontal.

The initial occlusal screening can identify prematurities and balancing interferences, which can contribute to periodontal problems.³⁹ When two or more teeth hit before the rest of the dentition, these contacts should be documented as prematurities.³⁹ Balancing interferences can be described as teeth in contact on the opposite side of the side in function. For example, when sliding the lower teeth to the left, any teeth touching on right side would be considered balancing interferences.

Finally, when completing the initial periodontal charting, the prudent clinician should chart any missing teeth, removable prostheses, dentures, existing restorations

(e.g. amalgams, composites, crowns, etc.) and carious lesions.^{64,67} Additionally, the clinician should chart any radiographic findings, such as endodontic treatment, overhangs, anomalies interproximal decay, calculus, periapical diseases, widened periodontal ligament spaces, and lost lamina dura continuity. These findings can assist in the diagnosis as well as the treatment plan.

Once the initial charting has been documented, it is imperative to routinely update the information, especially the clinical description of the patient's periodontal condition.⁴

The Informed Consent Doctrine

Case law on consent to medical [dental] treatment dates back to the turn of the century.¹⁶ Since that time, the primary question has been the same: Did the patient freely and fully authorize the treatment? Beginning in the mid-1950's the focus began to shift from the patient to the practitioner, specifically, the adequacy of the information that the practitioner provided to the patient.¹⁶ The courts recognized that the practitioner has the advantage of training and experience; consequently, he or she has a positive duty to share relevant information.^{10,16,38}

The duty of disclosure is on the doctor because the law looks upon the doctor-patient relationship as a special "fiduciary relationship" - a relationship of trust,

confidence, and responsibility.^{10,38} Furthermore, patients have the right to determine what they believe to be appropriate for their own bodies without medical or dental treatment forced on them.

In a leading decision on consent to medical treatment, one court observed:

A reasonable revelation in these respects is not only a necessity but, as we see it, is as much a matter of the physician's duty. It is a duty to warn of the dangers lurking in the proposed treatment, and that is surely a facet of due care. It is, though, a duty to import information which the patient has every right to expect. The patient's reliance upon the physician is a trust of the kind which traditionally has exacted obligations beyond those associated with arm'slength transactions. His dependence upon the physician for information affecting his well-being, in terms of contemplated treatment, is well-nigh abject.¹⁶

In light of this decision, failure to adequately provide information - even though the patient may have authorized the treatment - is viewed as negligent practice.^{16,38} A informed consent (disclosure) will be tried as a civil action or tort. Civil action, which is similar to any negligence claim, bases the legal proof to assert guilt on a "preponderance of the evidence." Therefore, to prevail on a factual dispute, a party's evidence, that usually consists of testimony and documents, must be more convincing than the evidence of the opponent.¹⁰

Bramson, et al.¹⁰ stated that ordinarily the plaintiff must prove the following items to prevail in an informed consent civil action:

1. a doctor/patient relationship existed;

2. the dentist had a duty to disclose certain information;
3. the dentist failed to provide this information;
4. the patient would not have consented to the treatment if a full disclosure had been made; and
5. that the failure to disclose was the cause of the injury to the patient.

To formulate what the duty to disclosure is, the courts will apply one of two basic methods: the "professional standards approach" or the "material risk approach."^{10,16,38,46}

Until the mid-1970's, the "professional standards approach" was the predominant legal theory governing the duty to disclosure requirements. This duty is formulated as follows:

[the duty] is limited to those disclosures which a reasonable medical practitioner would make under the same or similar circumstances. How the physician may best discharge his obligation to the patient in this difficult situation involves primarily a questions of medical judgment. So long as the disclosure is sufficient to assure an informed consent, the physician's choice of plausible courses should not be called into question if it appears, all circumstances considered, that the physician was motivated by the patient's best therapeutic interests, and he proceeded as competent medical men would have done in a similar situation.³⁸

The courts defined "material risk approach," which is the alternative theory to "professional standards," as follows:

In broad outline, we agree that "[a] risk is thus material when a reasonable person, in what the physician knows or should know to be the patient's position, would be likely to attach significance to the risk or cluster of risks in deciding whether or not to forgo the proposed therapy." The topics importantly demanding a communication of information are the inherent and potential hazards of the proposed treatment, the alternatives to that treatment, if any, and the results likely if the patient remains

untreated. The factors contributing significance to the dangerousness of a medical technique are, of course, the incidence of injury and the degree of harm threatened. A very small chance of death or serious disablement may well be significant; a potential disability which dramatically outweighs the potential benefit of the therapy or the detriments of the existing malady may summon discussion with the patient.³⁸

Of these two methods, the "material risk approach" is slowly gaining favor in many states; however, the medical profession is mostly opposed to its acceptance because it is usually more difficult to defend.^{10,38}

Informed Consent in Dentistry

Consent is an authorization, by the patient, that changes a touching from nonconsensual to consensual. Informed consent is the authorization from the patient with a full understanding of what is being consented.⁴⁷ The informed consent should include the:

1. risks and benefits of performing the recommended treatment;
2. risks and benefits of NOT performing the recommended treatment;
3. alternatives to the recommended treatment; and
4. cost for all recommended treatment.⁷

Christoffel¹⁶ states that the consent should include the:

1. nature of the procedure;
2. prospects for success;
3. prognosis if not performed;

4. diagnosis;
5. risks and complications of the procedure; and
6. alternatives.

Sokol⁵⁷ states that an informed consent exists when the patient:

1. receives a thorough disclosure regarding the proposed intervention;
2. comprehends this disclosure;
3. acts freely in giving this consent;
4. is competent to give this consent; and
5. actually consents to the intervention.

A properly administered informed consent allows patients to participate in the decision about the treatment to be rendered, as well as promotes an improved doctor/patient relationship.¹⁰ Additionally, patients should acknowledge an understanding of the informed consent and request the treatment they choose to be performed. Most important, dental practitioners must allow their patients to make the final decision relative to their treatment needs, even if the practitioner believes it to be the wrong decision.⁷ Boyce⁷ states that when patients participate in the decision-making process they perceive themselves in control of their health; consequently, they are accountable for the results of their decisions.

While many dentists believe that obtaining an informed consent will encourage litigious actions on the part of

their patients, it should be noted that an informed consent is more than a legal obligation. The informed consent can serve as a method to break the barrier to miscommunication, patient anxiety, as well as establish rapport and trust with the patient.

Dental Emergency Preparedness

Even though it is rare that the death of a patient occurs within a dental practice, Malamed³ states that life-threatening emergencies can and do occur in the practice of dentistry. A number of factors increase the probability of medical emergency occurring. These include:

1. recent therapeutic advances by the medical profession;
2. the trend toward longer appointments;
3. the increasing utilization and administration of drugs in the practice of dentistry; and
4. the growing number of mature adults with chronic diseases and/or individuals on multiple drug regimens who are seeking dental treatment.^{33,59}

Fortunately, dental practitioners have a number of other factors that could counterbalance the probability of life-threatening emergencies from occurring. They include:

1. the pretreatment physical evaluation of the dental patient (e.g. vital signs, oral cancer screening, etc.);
2. the comprehensive medical/dental history; and
3. possible modifications in dental therapy to decrease medical risks to the patient.³⁵

When incorporated in a dental practice, those factors could be categorized as preventive oriented skills. Furthermore, if those skills are utilized, the chances of medical emergencies occurring are dramatically reduced; conversely, if those skills are ignored, the frequency increases.^{30,33}

Classification of Life-Threatening Situations - The following is an example of a system-oriented classification of life-threatening situations that could occur in a dental practice:

1. Infectious diseases
2. Immune diseases
 - Allergy
 - Angioneurotic edema
 - Contact dermatitis
 - Anaphylaxis
3. Skin and appendages
4. The eye
5. Ear, nose and throat
6. Respiratory tract
 - Asthma
7. Cardiovascular system
 - Arteriosclerotic heart disease
 - Angina pectoris
 - Myocardial infarction
 - Heart failure
8. Blood
9. Gastrointestinal tract and liver
10. Obstetrics and gynecology
11. Nervous system
 - Unconsciousness
 - Syncope
 - Hyperventilation syndrome
 - Vasodepressor syncope
 - Orthostatic hypotension
 - Convulsive disorders
 - Epilepsy
 - Overdose reactions
 - Cerebral vascular accident
12. Endocrine disorders

Diabetes mellitus
 Hyperglycemia
 Hypoglycemia
Thyroid gland
 Hyperthyroidism
 Hypothyroidism
Adrenal gland
 Acute adrenal insufficiency

This system-oriented classification can assist the dental practitioner when preparing a workable treatment plan for the prevention of medical emergencies.

Skills for the Prevention of Life-Threatening Situations -

Ninety percent of all life-threatening situations are preventable; however, the remaining 10% will occur in spite of all efforts at prevention.^{30,33} Because of this, system-oriented prevention is not enough. The dental team must be fully prepared to assist in the recognition and management of medical emergencies.^{30,33,59}

The dental team can begin with the most important factor, emergency training for all dental personnel. The dental team should attend courses in medical emergencies, including basic life support (cardiopulmonary resuscitation). Furthermore, the dental team should establish and periodically rehearse their medical emergency protocols.^{20,30,33,59} An example of an emergency protocol is as follows:

1. Member 1 (dentist) stays with patient and calls member 2;
2. Member 2 (assistant) gets portable oxygen and the emergency drug kit;

3. Member 3 (hygienist) assists member 1 by monitoring and recording vital signs; and
4. Member 4 (receptionist) calls for medical assistance (911).³³

All dental offices must have available a medical emergency kit with drugs.³³ Most dental emergencies do not require drug administration; however, in acute allergic reactions, the administration of epinephrine would be essential.^{20,33,59}

Because dentists are facing new challenges- treatment of an aging society and medically-compromised patients - the opportunity for a life-threatening situation to occur in the dental office increases.³⁰ Consequently, a responsible attitude towards emergency management should be seen as part of the legal and professional responsibilities of the dental team.

Summary

The recommended risk management techniques in dental and medical environments were reviewed according to the following subject areas: 1) the importance of complete and accurate medical records and documentation strategies; 2) infection control protocols; 3) periodontal disease identification and classification; 4) the informed consent doctrine; and 5) dental emergency preparedness. While it may not be feasible to incorporate into actual practice all

of the recommendations included in this review, continual assessment and updating of methods is essential. Any improvements which are incorporated reduce the potential legal risks and thereby reduce unplanned financial losses.

The main shortcoming of the literature is the absence of research to support risk management standards. Areas which demand continued research include the following:

1. risk management strategies used to improve medical record keeping and documentation;
2. the development of risk management infection control protocols;
3. the development of standardized informed consent procedures;
4. risk management strategies used to reduce civil actions relative to periodontal classification and documentation;
5. risk management strategies used to improve medical emergency protocols; and
6. the development of standardized office manual policies and procedures.

CHAPTER 3

Methods and Materials

Three hundred dental practices within the Commonwealth of Virginia were mailed packets containing a self-designed questionnaire, a cover letter, and a stamped, addressed envelope. Questionnaires returned within a four week data collection period were analyzed to determine compliance with the standards of dental risk management theory. Analysis techniques included chi-square goodness-of-fit test and frequency and percentage of responses.

Sample Description

The accessible population for this study included all licensed dentists of the Commonwealth of Virginia. The mailing list, consisting of 3800 licensed dental practitioners, was purchased from the Virginia Board of Dentistry. Each address was assigned a number and a computer generated the 300 random numbers which formulated the sample.

The majority of responses were from general practitioners. The mean age was 40-49 years; the mean number of years in practice group was 10-14; the mean number of staff was: 2.2 dentists, 2.4 dental assistants, 1.1

dental hygienists, and 1.3 dental receptionists.

A cover letter and questionnaire were addressed to the dentist(s) of each randomly selected dental practice. This was based upon the assumption that the dentist is the person who has direct control over the degree to which risk management techniques are utilized.

Methodology

Content validity of the self-designed questionnaire was established by consulting experts in risk management. Comments received from this group were used to revise and improve the questionnaire. A pilot study was conducted to establish the content validity of the questionnaire. The pilot study sample (N=12) consisted of six practicing dentists, two risk managers, two quality assurance coordinators, and two attorneys. Respondents indicated that the questionnaire required the following revisions to improve the validity of the instrument:

1. Addition of two questions under "Demographics" to better describe the sample population;
2. Clarification of items numbered 2, 6, 8 through 10, 15, 20, 24, 27, 28, 42, 43, 44, 45, and 53 to eliminate ambiguous meanings;
3. Omission of items numbered 3 and 48; and
4. Revision of items numbered 15, 20, 24 through 27, and 43 to eliminate ambiguous meaning.

The revised questionnaire and cover letter were mailed to 300 dental practices within the Commonwealth of Virginia. Participants were asked to respond to the questionnaire honestly and completely and assured anonymity and confidentiality. A stamped, addressed envelop also was provided to enhance the return of completed questionnaires.

Anonymity was maintained by the return postcard technique¹⁷ (see Appendix D). Upon returning the completed questionnaire, respondents were asked to mail a separate, pre-stamped postcard with their name and address, so that those who had not responded could be identified and sent follow-up material. Nonrespondents were identified only by the absence of this returned postcard.

To control for a low response rate, a second questionnaire, stamped, addressed envelop, and a new cover letter were mailed to the nonrespondents after the second week of the study (see Appendix C).

Protection of Human Subjects

In accordance with the policy on research using human subjects, survey participants were protected by the following methods:

1. Subject Population - This research investigation required a target population of Virginia dentists to survey the risk management techniques currently used in practice. This population was randomly selected from the list of

licensed dentists held by the Virginia Board of Dentistry.

2. Potential Risks - A potential risk to the participants could be anxiety due to the disclosure of their deficient risk management practices. This risk was minimized by assuring confidentiality and anonymity to the respondents and reporting data in group form only.

3. Consent Procedures - Participation in the study was voluntary. The completion and return of the questionnaire indicated the subject's consent to participate in the study.

4. Protection of Subjects' Rights - Confidentiality and anonymity were maintained throughout the investigation. The participants will remain anonymous via the return postcard technique indicating their completion of the questionnaire. To augment confidentiality, data are reported in group form only.

5. Potential Benefits - The investigation provides data on the current risk management techniques used in Virginia dental practices. Dental health care providers could use this data to compare their current dental risk management techniques to those practiced by other providers, and to those recommended in the current literature. Additionally, this investigation provides information that educators, researchers, and dental practitioners could use to design courses and seminars, propose additional research, and evaluate risk management techniques in dental practices.

6. Risk/Benefit Ratio - Based upon the results of this investigation, dental practitioners could use the data to compare their risk management techniques to those of other dental practitioners and to those recommended in the literature. Additionally, the data from this investigation could be used to assess the quality of care rendered to patients and, ultimately, improve the quality of dental care to society.

Instrumentation

The questionnaire was reviewed critically by experts in risk management, and the comments from those individuals were used to revise the questionnaire.

A questionnaire was selected as the ideal measurement instrument of choice because:

1. respondents can complete the questionnaire in privacy and at their leisure,
2. respondents anonymity can be maintained, and
3. a large geographic region can be assessed.

The self-designed questionnaire consisted of 51-items; the majority of these were closed-ended to encourage complete responses. The participants needed approximately 15 minutes to complete the questionnaire.

The questionnaire was divided into six categories related to dental care in the private practice setting: 1) the medical record and documentation strategies, 2)

infection control measures, 3) informed consent procedures, 4) identification and classification of periodontal patients, and 5) emergency protocols.

Questions 1 and 2 determined ownership of the dental practice.

Questions 3 through 13 surveyed the risk management techniques used when reviewing and documenting the Medical/Dental History Form and the Services Rendered Record.

Question 14 determined the legibility of the dental record.

Question 15 determined which dental records are retained in the dental practice.

Questions 16 and 17 surveyed the techniques used to identify a "high risk" patient.

Question 18 surveyed patient premedication policies.

Question 19 determined when blood pressure measurements are taken.

Question 20 determined who performs the intra- and extra-oral examination.

Question 21 determined how errors are eliminated from the dental record.

Questions 22 through 24 determined when safety glasses, facemasks, and gloves are worn.

Question 25 determined when gloves are changed.

Question 26 surveyed handwashing practices.

Question 27 determined who in the dental practice has had the Hepatitis B vaccine.

Questions 28 through 32 determined the methods of instrument cleaning and sterilization.

Question 33 determined the methods of surface disinfection.

Question 34 determined when disposable items are discarded.

Questions 35 and 36 determined the infection control procedures used with a "high risk" patient.

Questions 37 through 39 surveyed informed consent to care policies.

Question 40 determined the methods of periodontal classification.

Questions 41 through 43 surveyed emergency protocols.

Questions 44 through 51 surveyed specific office policies.

Statistical Treatment

Results were tabulated using the SPSS-X System. Discrete, nominal data were obtained and nonparametric statistics were used to analyze the data.

Selected questionnaire items were analyzed via the chi-square goodness-of-fit, and each item analyzed via frequency and percentage of responses. Additionally, cross-tabulations were performed among variables such as dental

specialty, age, size or practice, formal education on the principles of risk management, and specific dental practice techniques.

CHAPTER 4

Results and Discussion

Compliance with the standards of risk management theory among dental practices was investigated by surveying 300 dental practices within the Commonwealth of Virginia. Ninety-one questionnaires (30%) were returned from the first mailing and 95 (32%) were returned from the second mailing, resulting in a 62 percent response rate. One hundred seventy (56%) questionnaires were suitable for analysis. Reasons for the 9 percent (n=16) unusable questionnaires included: respondents unwilling to participate, respondents felt the questionnaire was not applicable to their practice, deceased or retired respondents, incomplete questionnaires, or nonresponse.

Data from each item were analyzed using frequency and percentage of responses and a chi-square goodness-of-fit test to determine if compliance with the theory of risk management existed in dental practices within the Commonwealth of Virginia. Results obtained from each questionnaire item are reported in Appendix E.

Results are discussed in relation to the research questions addressed in the section on statement of the problem.

Results

Demographic data were obtained from items one through five located at the end of the questionnaire. Item one requested respondents to indicate their age from the following increments: 22-29, 30-39, 40-49, or 50 years or older. Of the total number of respondents, the majority 39.4% (n=67) were between the age of 30 and 39 (see Figure 1A).

Item two requested respondents to indicate the number of years they have practiced from the following increments: 1 year or less, 2-4, 5-9, 10-14, 15-19, 20-24, or 25 years or more. Twenty-two percent (n=38) practiced 25 years or more, and 21.8% (n=37) practiced between 10 and 14 years (see Figure 1B).

Item three requested respondents to indicate their dental specialty from the following selections: endodontist, general practitioner, oral and maxillofacial surgeon, oral pathologist, orthodontist, pediatric dentist, periodontist, prosthodontist, or public health dentist. Of the total number of respondents, the majority 77.1% (n=131) were general practitioners (see Figure 1C).

Item four requested respondents to indicate the number of employees in their practice. Of the total replies, 62.9% (n=107) had one dentist, 34.7% (n=59) had one dental assistant, 42.9% (n=73) did not have a dental hygienist, and 52.4% (n=89) had one dental receptionist in their dental

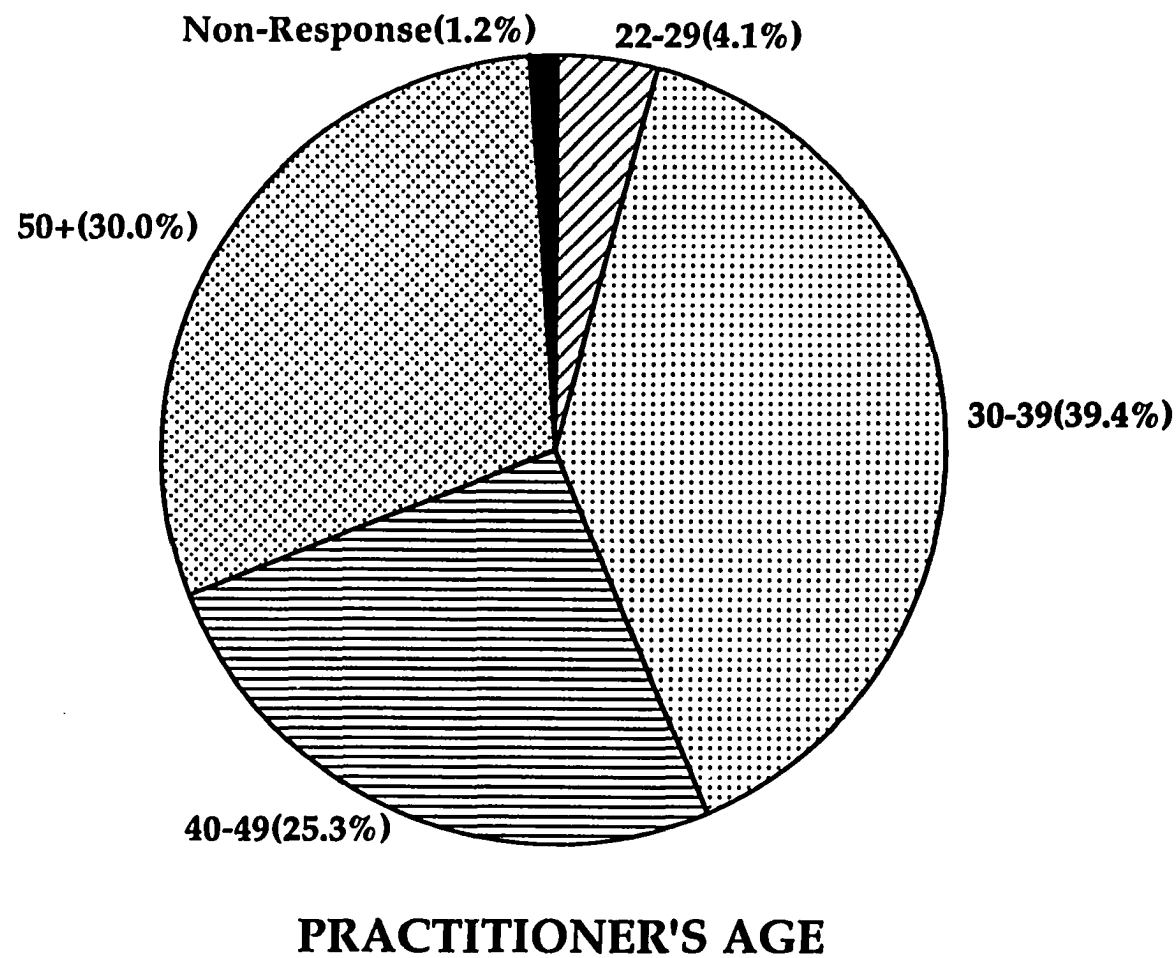
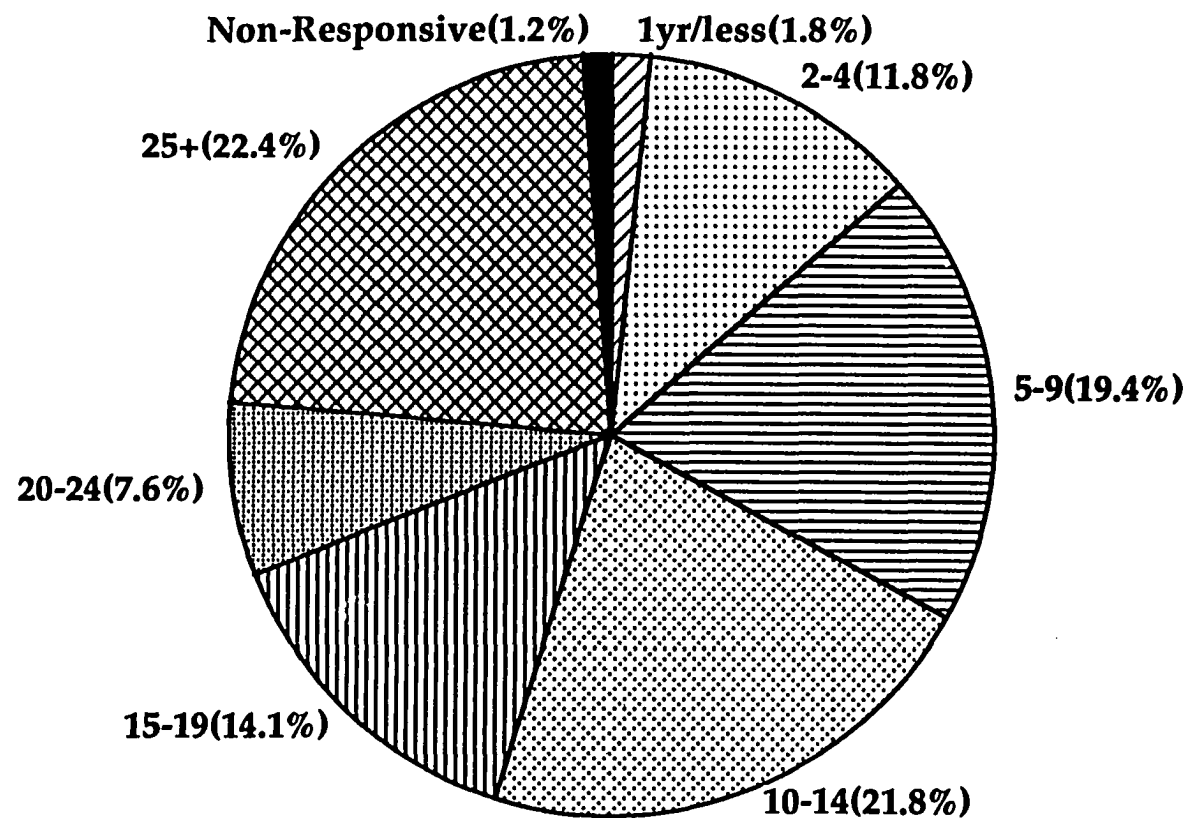
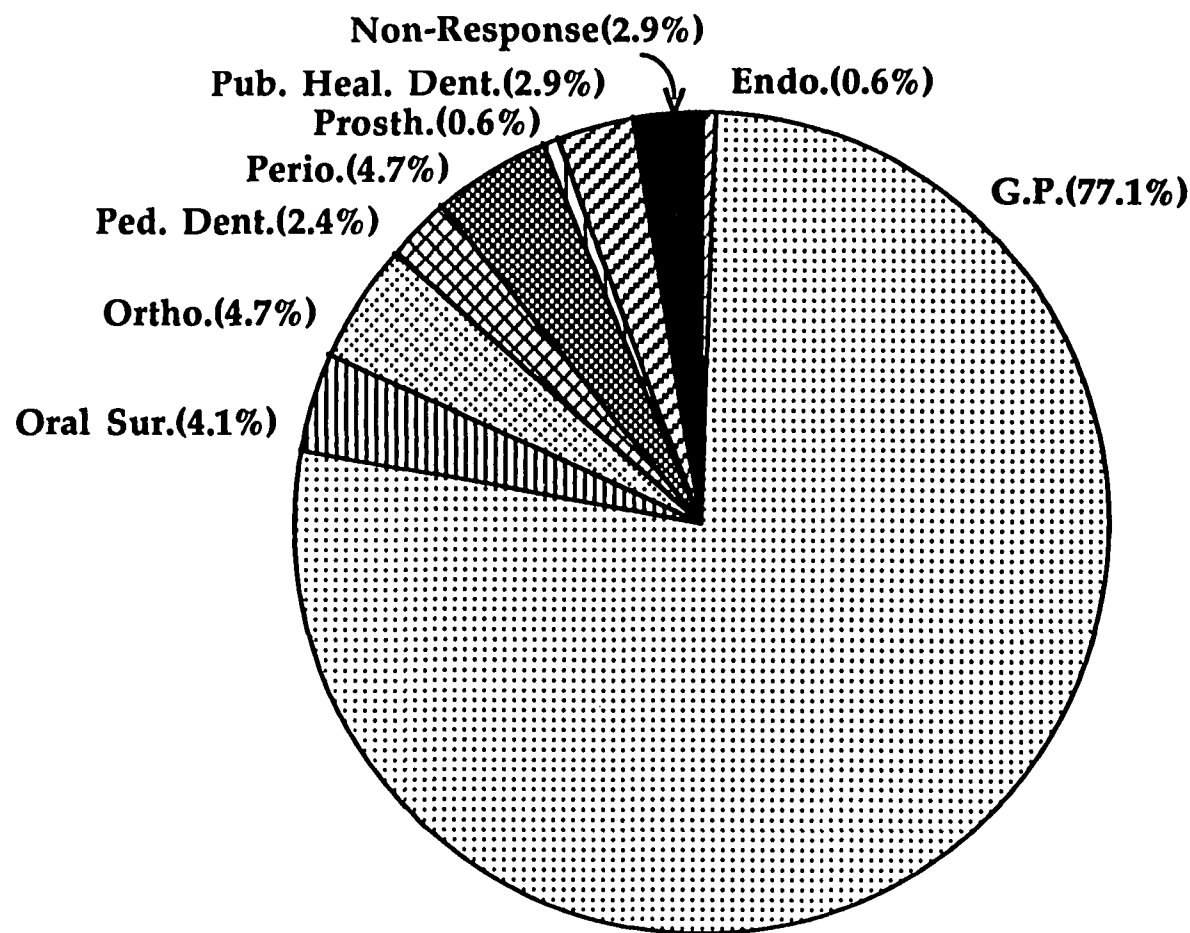


Figure 1A. Characteristics of Virginia dentists who participated in the survey on risk management practices (Practitioner's Age).



PRACTITIONER'S YEARS IN PRACTICE

Figure 1B. Characteristics of Virginia dentists who participated in the survey on risk management practices (Practitioner's Years in Practice).



PRACTITIONER'S DENTAL SPECIALTY

Figure 1C. Characteristics of Virginia dentists who participated in the survey on risk management practices (Practitioner's Dental Specialty).

practice (see Figure 1D).

Item five queried respondents regarding their attendance at a risk management seminar. Thirty-eight percent (n=65) had attended a risk management seminar, and 58.8% (n=100) had not attended a risk management seminar. The remaining 3.2% did not respond to this item (see Figure 1E).

Research Question One

Are documentation techniques used when reviewing and recording medical/dental histories? Twenty-one questionnaire items (1-21) provided information relative to this question.

Overall responses (N = 170) to item 1 indicated that the majority of dentists (69.4%) were the original owners of their dental practice, while the remainder were not the original owners. Two separate cross-tabulations using chi-square analysis were performed. The first analysis, using the respondents' age as the variable, revealed that there was a significant relationship between the age of respondents and their ownership status ($p = 0.0000$, $df = 8$), indicating that dentists 30 years and older were original owners of their dental practices. The second analysis, using the respondents' dental specialty, was inconclusive; however, direct observation suggests that a relationship exists between general practitioners and their ownership status.

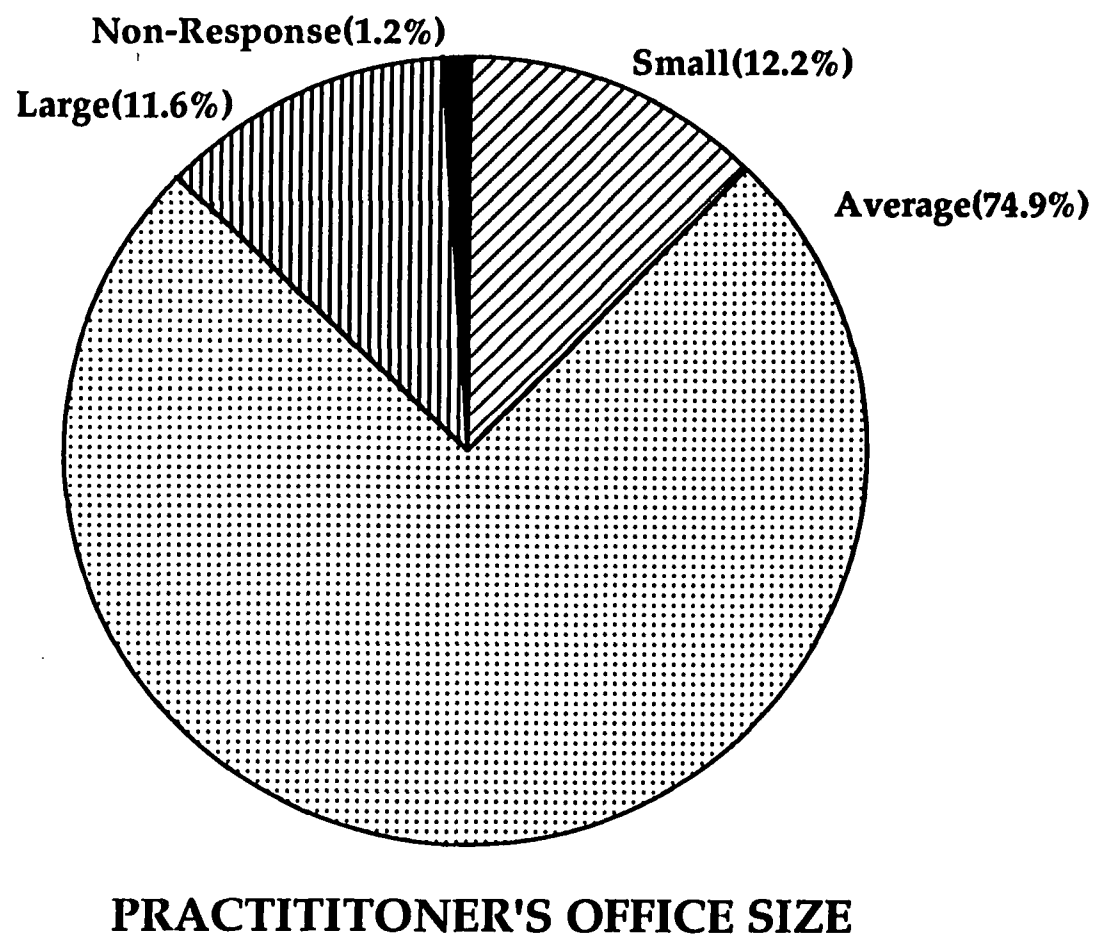
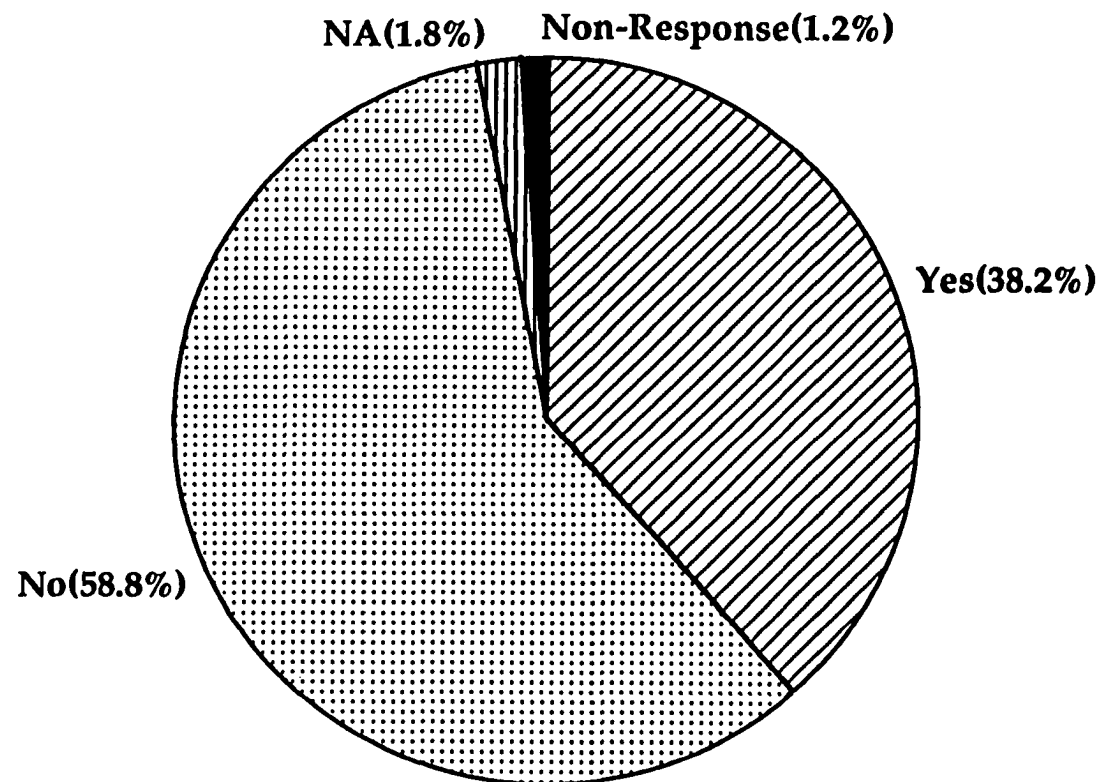


Figure 1D. Characteristics of Virginia dentists who participated in the survey risk management practices (Practitioner's Office Size).



PRACTITIONER'S FORMAL EDUCATION ON RISK MANAGEMENT

Figure 1E. Characteristics of Virginia dentists who participated in the survey on risk management practices (Practitioner's Formal Education on Risk Management).

Item 2 queried whether a written consent was obtained from each patient granting access to his/her dental record if the practice was purchased from another practitioner. Of the overall responses, 78.2% indicated that item 2 was not applicable to their situation. Nineteen percent indicated they did not receive a written consent, while 1.2% indicated that they did receive a written consent. Three cross-tabulations, using chi-square analysis, were performed (see Table 1). Although analysis revealed a significant relationship between the practitioner's age and item 2 ($p = 0.0063$, $df = 12$), and years in practice and item 2 ($p = 0.0000$, $df = 21$), further analysis showed that the results were inconclusive due to the majority (78.2%) of not applicable responses. The second analysis, using the respondents' dental specialty, yielded no statistically significant relationship between the respondents' dental specialty and item 2 ($p = 0.9201$, $df = 24$).

Item 3 indicated that the majority of dentists (79.9%) use ball point pens as a recording device on the medical/dental history form. Approximately, 13.2% of the respondents use felt tip pens, 5.4% use pencils, and 1.5% use another type of recording device. Cross-tabulations were performed using the variables of age, years in practice, dental specialty, size of practice, and formal education on the principles of risk management. Cross-tabulations revealed that of the respondents who used a ball

TABLE 1

**TYPE OF RECORDING DEVICE USED BY VIRGINIA DENTIST ACCORDING
TO AGE, YEARS IN PRACTICE, SPECIALTY, PRACTICE SIZE, AND
FORMAL EDUCATION IN RISK MANAGEMENT PRACTICES**

	Age	Yrs in Practice	Specialty	Practice Size	Risk Management Seminar
BALL POINT PEN	30 - 39 (39.1%)	25+ YRS (22.4%)	G.P.* (79.1%)	AVERAGE (76.1%)	NO (60.2%)
FELT TIP PEN	30 - 39 (48.1%)	5 - 9 YRS (29.6%)	G.P.* (66.7%)	AVERAGE (85.2%)	NO (59.3%)
PENCIL	50+ YRS (36.4%)	25+ YRS (36.4%)	G.P.*% (81.8%)	AVERAGE (54.5%)	YES (54.5%)

***KEY**

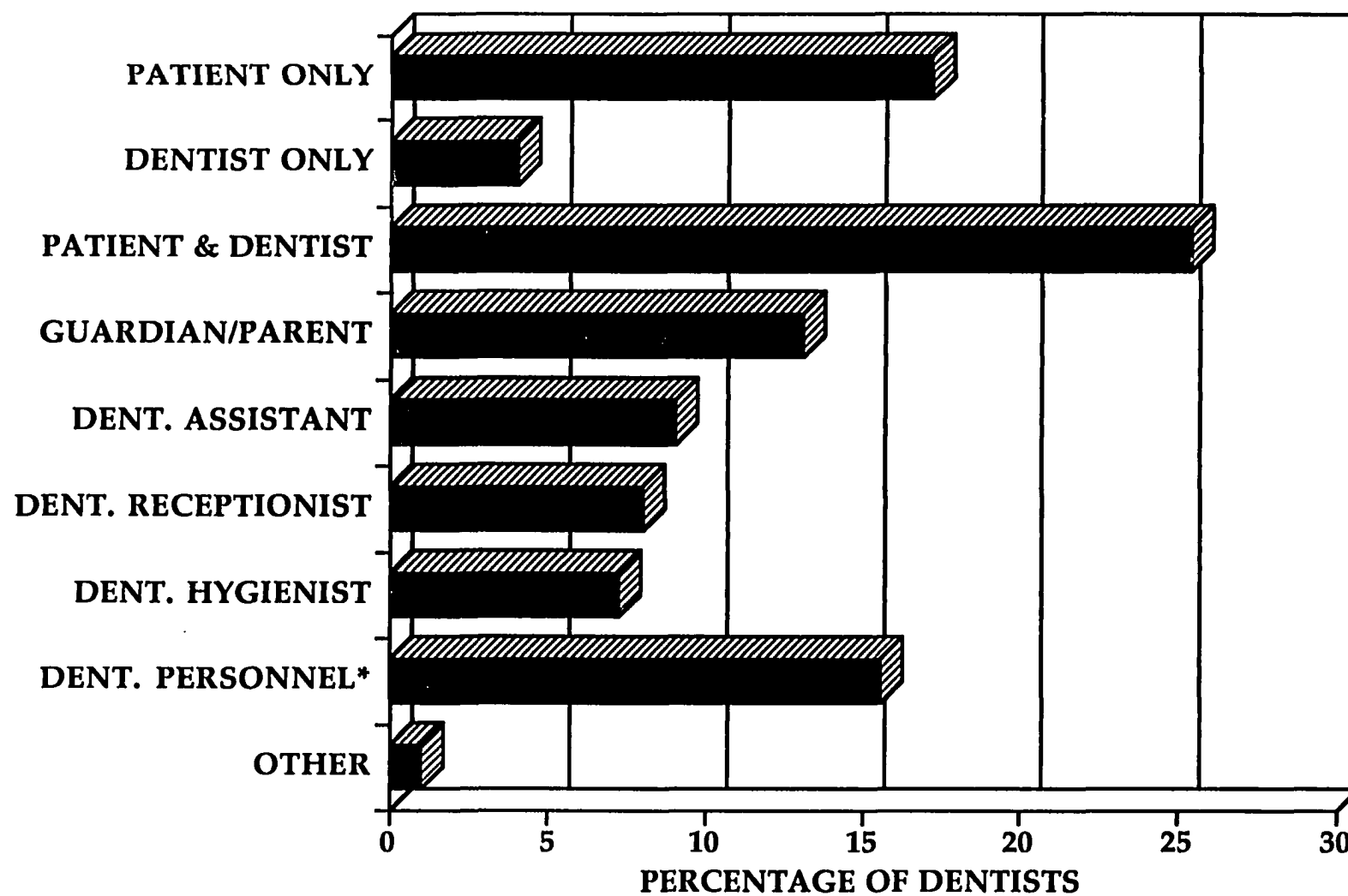
G.P. - General Practitioner

point pen, 39.1% were between 30-39 years old; had practiced 25 years or more (22.4%); were more likely to be general practitioners (79.1%); had not attended a risk management seminar (60.2%); and were from average size ($2 < n < 10$) practices (76.1%). Those respondents who used a felt tip pen were between 30-39 (48.1%) years old; had practiced between 5-9 years (29.6%); were more likely to be general practitioners (66.7%); had not attended a risk management seminar (59.3%); and were from average size ($2 < n < 10$) practice (85.2%). Respondents more likely to use a pencil were 50 years and older (36.4%); had practiced 25 years and over (36.4%); were general practitioners (81.8%); had attended a risk management seminar (54.5%); and were from average size ($2 < n < 10$) practices (54.5%). Chi-square analysis was not performed on item 3.

Item 4 indicated that 77.6% of the respondents use a ball point pen as a recording device on the services rendered form. Fourteen percent of the respondents use a felt tip pen, 6.2% indicated they used a pencil, while 2.4% indicated they used another type of recording device. Cross tabulations were performed using the variables of age, years in practice, dental specialty, size of practice, and formal education on the principles of risk management. Cross tabulations revealed that of the respondents who used a ball point pen, 39.1% were between the ages of 30 and 39; had practiced 25 years of more (22.4%); were more likely to be

general practitioners (79.1%); had not attended a risk management seminar (59%); and were from average size ($2 < n < 10$) practices (75.5%). Those respondents who used a felt tip pen on the services rendered form were between 30 and 39 years of age; had practiced between 5 and 14 years (48%); were more likely to be general practitioners (65.5%); had not attended a risk management seminar (58.6%); and were from average size ($2 < n < 10$) practices. Respondents more likely to use a pencil were between 30 and 39 years of age; had practiced 5 to 14 years (60%); were more likely to be general practitioners (92.3%); had not attended a risk management seminar (61.5%); and were from average size ($2 < n < 10$) practices (84.6%). Chi square analysis was not performed on item 4.

Item 5 asked who completes the medical/dental history form (see Figure 2). One-fourth of the respondents (25.4%) reported that the patient and the dentist complete the medical/dental history form. The next most frequent response (17.2%) was that only the patient completes the form. The dental personnel completes the form when the patient is not able was the third most frequent response (15.6%). The fourth most frequent response (13.1%) reported that the guardian/parent completes the form, followed by the dental assistant (9%). Eight percent of the respondents reported that the dental receptionist completed the medical history, while 7.2% reported that the dental hygienist



* Only when patient is not able

Figure 2. Various individuals who complete the medical/dental history form in Virginia dental offices.

completes the medical history. Four percent reported that only the dentist completes the medical history, while 1% reported that another individual completes the form. Cross tabulations, using the chi-square analysis, were performed using the variables of age, years in practice, dental specialty, and formal education on the principles of risk management. The first analysis revealed no relationship between the respondent's age and item 5; all age groups tended to respond similarly. The second analysis revealed statistically significant results ($p = 0.0302$, $df = 7$) between the number of years in practice and the selection "dental personnel complete the medical history only when the patient is unable to complete the form" of item 5. Those respondents who stated that dental personnel complete the medical history practiced between 5 and 9 years. The third analysis revealed a statistically significant relationship ($p = 0.0149$, $df = 8$) between the respondent's dental specialty and the selection, "other," regarding which individuals complete the Medical/Dental History Form. Orthodontists responded more frequently to the selection, "other," than any other dental specialist. The fourth analysis revealed that most respondents had not attended a risk management seminar.

Item 6 questioned respondents regarding when the medical/dental history was reviewed (see Figure 3). The majority of the respondents (75.6%) stated they reviewed the

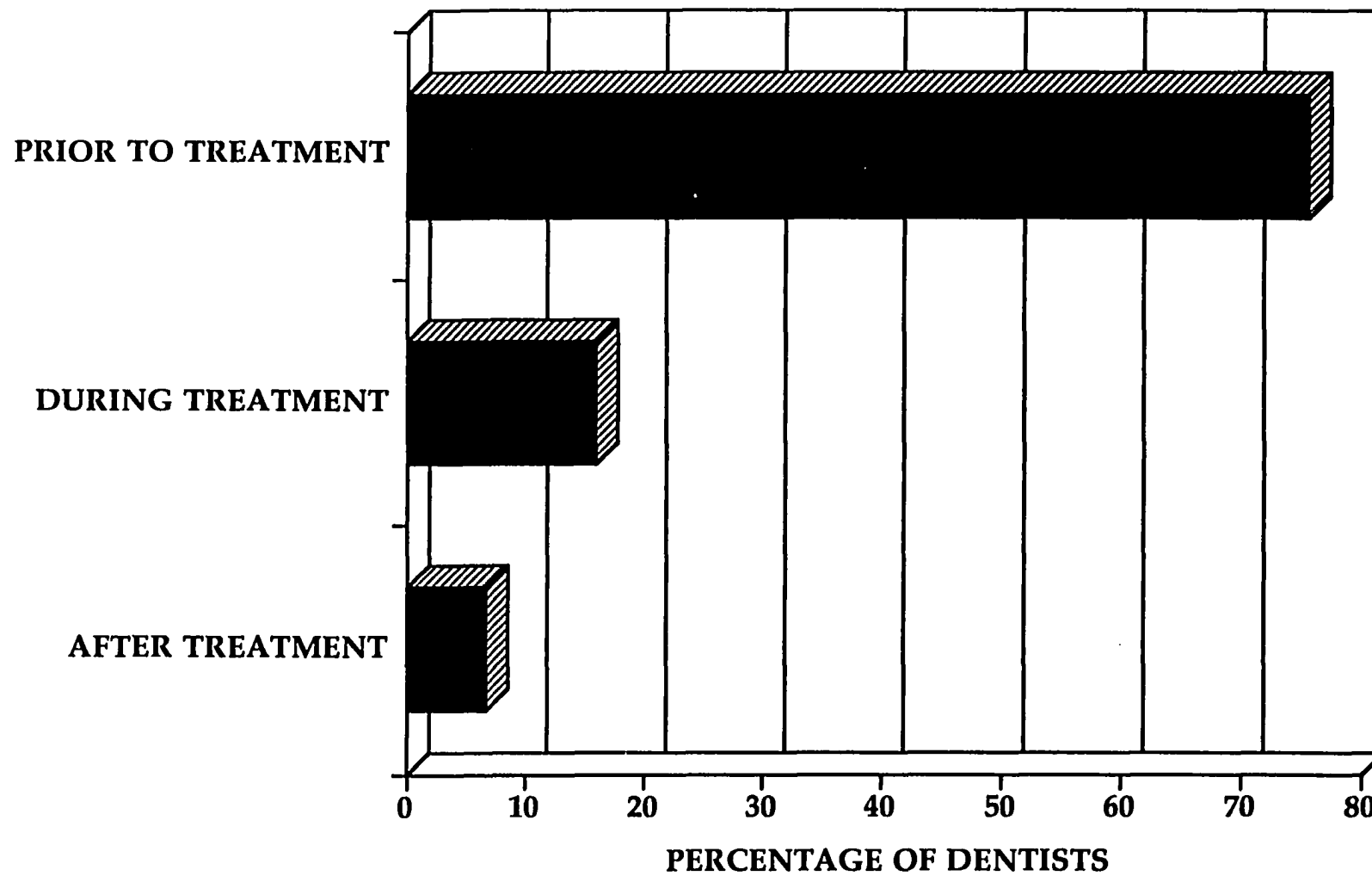


Figure 3. Virginia dentists who review the medical/dental history prior, during, or after treatment.

medical history prior to treatment. Sixteen percent stated they reviewed the medical history during treatment, while 6.8% reported that they reviewed the medical history after treatment of the patient. Cross tabulations were performed using the variables of age, years in practice, dental specialty, size of practice, and formal education on the principles of risk management. Cross tabulations revealed that of the respondents who reviewed the medical history prior to treatment, 40% were between 30 and 39 years of age; had practiced 25 years or more (22.4%); were more likely to be general practitioners (79%), and as likely to be oral surgeons (4%), periodontists (5%), or orthodontists (5%); had not attended a risk management seminar (60%); and were from average size ($2 < n < 10$) practices (75.4%). The respondents who reviewed the medical history during treatment were 50 years or older (38.9%); had practiced 25 years or more (38.9%); more likely to be general practitioners (77.8%); had not attended a risk management seminar (58.3%); and were from average size ($2 < n < 10$) practices (77.8%). Respondents more likely to review the medical history after treatment were between 30 and 39 years of age (46.7%); had practiced between 10 and 14 years (40%); were more likely to be general practitioners (80%); had not attended a risk management seminar (66.7%); and were from average size ($2 < n < 10$) practices (80%) (see Table 2). Chi-square analysis was not performed on item 6.

TABLE 2

**WHEN MEDICAL/DENTAL HISTORIES ARE REVIEWED BY VIRGINIA DENTISTS
ACCORDING TO AGE, YEARS IN PRACTICE, SPECIALTY, PRACTICE SIZE
AND FORMAL EDUCATION IN RISK MANAGEMENT PRACTICES**

	Age	Yrs in Practice	Specialty (ies)	Practice Size	Risk Management Seminar
PRIOR TO TREATMENT	30 - 39 (40%)	25+ YRS (22.4%)	G.P.*, O.S.*, Perio*, Ortho* (93%)	AVERAGE (75.4%)	NO (60%)
DURING TREATMENT	50+ YRS (38.9%)	25+ YRS (38.9%)	G.P.* (77.8%)	AVERAGE (77.8%)	NO (58.3%)
AFTER TREATMENT	30 - 39 (46.7%)	10 - 14 YRS (40%)	G.P.*% (80%)	AVERAGE (80%)	NO (66.7%)

***KEY**

G.P. - General Practitioner
O.S. - Oral Surgeon

Perio - Periodontist
Ortho - Orthodontist

Overall responses to item 7 indicated that 28.5% of the respondents reviewed only the positive responses on the medical/dental history. Seven percent indicated that they reviewed only the negative responses, while 60.5% indicated they reviewed both positive and negative responses. Four percent responded to the selection, "other," regarding which medical history responses are reviewed with the patient. Cross tabulations revealed that of the respondents who reviewed only positive responses on the medical history, 39.6% were between the ages of 30 and 39; had practiced between 5 and 9 years (22.9%); were more likely to be general practitioners (83.3%), orthodontists (4.2%), and public health dentists (4.2%); had not attended a risk management seminar; and were from average size ($2 < n < 10$) practices (87.8%). Those respondents who indicated they reviewed only negative responses were 50 years or older (41.7%); had practiced between 15 and 24 years (54.6%); were more likely to be general practitioners (91.7%); had not attended a risk management seminar (83.3%); and were from small size ($n < 2$) practices (58.3%). Respondents more likely to have reviewed both negative and positive responses on the medical history were between 30 and 39 years of age; had practiced 10-14 years (24%) and 25 years or more (24%); were most likely to be general practitioners (76%), oral surgeons (6%), and periodontists (7%); had not attended a risk management seminar (58.3%) and were from average size

($2 < n < 10$) practices (73.1%). Chi-square analysis was not performed on item 7.

Item 8 determined who in the dental practice signs the medical/dental history after it has been reviewed (see Figure 4). The majority of the respondents (70.4%) stated that the patient signs the medical history after it has been reviewed. The next most frequent response (26.3%) was the dentist signed the medical history, followed by the dental hygienist (2.2%). Only 1.1 percent of the respondents stated that the dental assistant signed the medical history after it was reviewed. Cross tabulations revealed that of the respondents who indicated the patient signed the medical history after it was reviewed, 42.6% were between 30 and 39 years of age; practiced between 10-14 years; were more likely to be general practitioners (80.2%) or periodontists (6.3%); had not attended a risk management seminar (59.7%); and were from average size ($2 < n < 10$) practices (77.9%). Respondents that stated the dentist signed the medical history were 30 to 39 years old; had practiced 25 years or more (24.5%); were more likely to be general practitioners (74.5%), periodontists (10.6%) or public health dentists (6.4%); had not attended a risk management seminar (51%); and were from average size ($2 < n < 10$) practices (61.2%). Those respondents who indicated the dental assistant signed the medical history after it was reviewed were 50 years or older; had practiced 25 years or more; were general

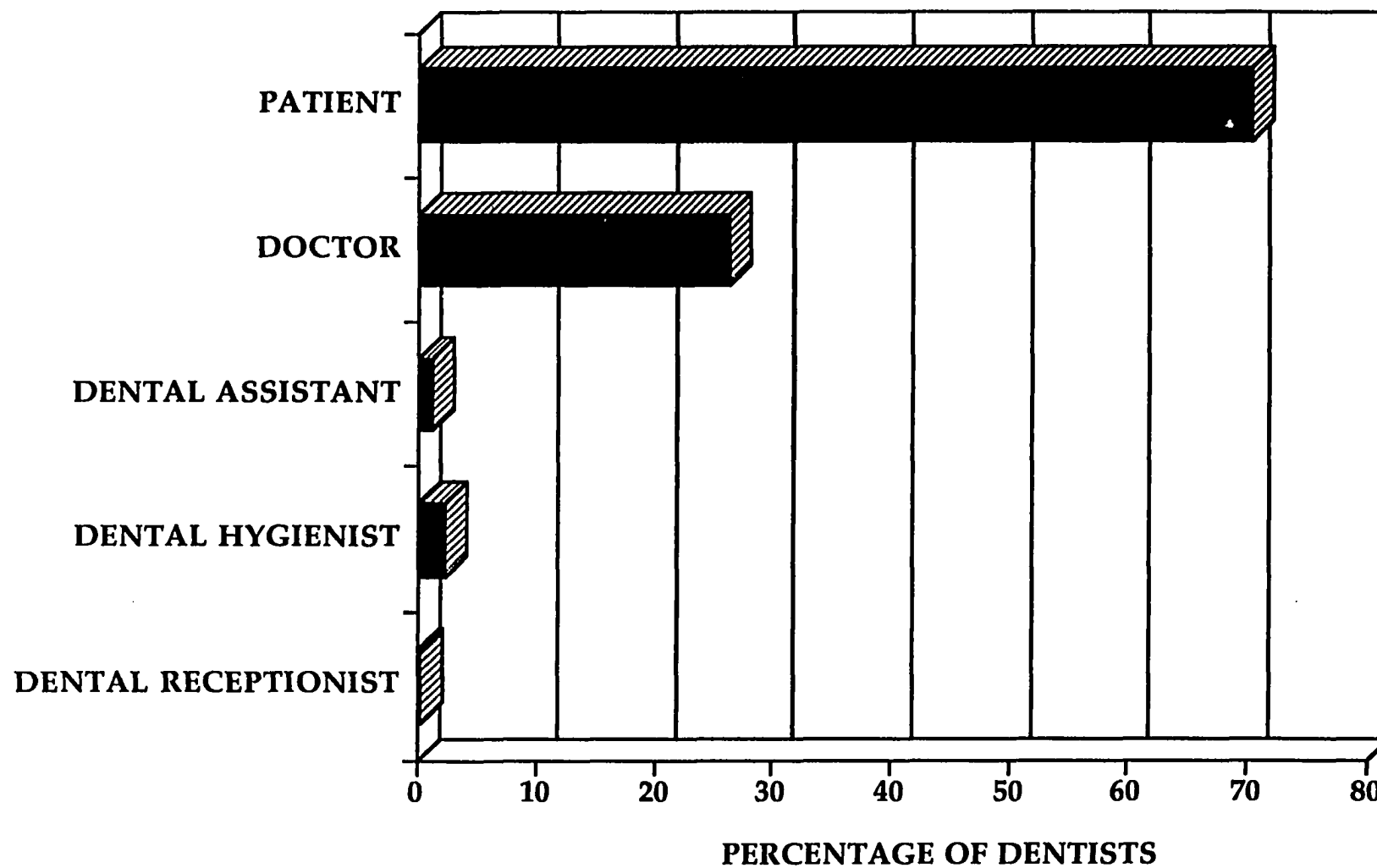


Figure 4. Various individuals who sign the medical/dental history form in Virginia dental offices. ⁶⁹

practitioners (100%); and were from average size ($2 < n < 10$) practices (100%). Respondents who indicated the dental hygienist signed the medical history after it was reviewed were 40 to 49 years old (50%); had practiced 15-19 years (75%); were more likely to be general practitioners (50%), pediatric dentists (25%) or periodontists (25%); had attended a risk management seminar (75%); and were from average size ($2 < n < 10$) practices (75%) or large size ($n > 10$) practices (25%) (see Table 3). Chi-square analysis of the data was inconclusive.

Item 9 queried when the medical/dental history form was updated. Nineteen percent indicated that they updated the medical/dental history at every appointment; 36.9% responded that they updated the medical/dental history at every recall appointment; 25.1% updated the history only once a year; 9% updated the history once every three years; 1.6% indicated they never updated the history; and 8% responded to the selection, other. Cross tabulations were performed using the variables age, years in practice, dental specialty, size of practice, and formal education on the principles of risk management. Respondents most likely to update their medical/dental histories at every appointment were 30 to 39 years of age (51%); had practiced between 10 and 14 years (25%); were general practitioners (71%) and pediatric dentists (8.6%); had not attended a risk management seminar (52.8%); and were from average size ($2 < n < 10$) practices

TABLE 3
INDIVIDUALS WHO SIGN THE MEDICAL/DENTAL HISTORY ACCORDING TO VIRGINIA DENTISTS' AGE, YEARS IN PRACTICE, SPECIALTY, PRACTICE SIZE, AND FORMAL EDUCATION IN RISK MANAGEMENT PRACTICES

	Age	Yrs in Practice	Specialty (ies)	Practice Size	Risk Management Seminar
PATIENT	30 - 39 (42.6%)	10 - 14 YRS (23.8%)	G.P.* (80.2%) Perlo* (6.3%)	AVERAGE (77.9%)	NO (60%)
DOCTOR	30 - 39 (36.7%)	25+ YRS (24.5%)	G.P.* (77.8%)	AVERAGE (61.2%)	NO (58.3%)
DENTAL ASSISTANT	50+ (100%)	25+ YRS (100%)	G.P.*% (80%)	AVERAGE (100%)	NO (66.7%)
DENTAL HYGIENIST	40 - 49 (50%)	14 - 19 YRS (75%)	G.P.*% (80%)	AVERAGE (75%) LARGE (25%)	YES (75%)

***KEY**

G.P. - General Practitioner
O.S. - Oral Surgeon

Perlo - Periodontist
Ortho - Orthodontist

(69.4%). Of the respondents who updated their medical/dental history form at every recall appointment, 37.7% were between 30 and 39 years of age; had practiced between 10 and 14 years (29.4%); were more likely to be general practitioners (79.4%) or periodontists (10.3%); had not attended a risk management seminar (50.7%); and were from average size ($2 < n < 10$) practices (81.2%). Those respondents who indicated they updated the medical/dental history form once a year were between 30 and 39 years of age (39.1%); had practiced between 5 and 9 years (21.7%); were more likely to be general practitioners (82.2%), orthodontists (6.7%) and public health dentists (6.7%); had not attended a risk management seminar (63%); and were from average size ($2 < n < 10$) practices (74.5%). Respondents who updated the medical/dental history once every three years were 50 years or older; had practiced 25 years or more; were more likely to be general practitioners (82.4%) and orthodontists (11.8%); had not attended a risk management seminar (70.6%); were from average size ($2 < n < 10$) (82.4%) and large size ($n > 10$) (17.6%) practices. Respondents who never updated medical/dental histories were 50 years or older (66.7%); had practiced 25 years or more (66.7%); were more likely to be orthodontists (66.7%) and general practitioners (33.3%); had not attended a risk management seminar (100%); and were from average size (66.7%) and large size (33.3%) practices. Chi-square

analysis was not performed on item 9.

Of the overall responses ($n = 170$) to item 10, 94.1% indicated that each entry on the Services Rendered Record was in chronological order and on consecutive lines, 3.5% indicated they did not enter data in chronological order on consecutive lines, and 2.4% did not respond to the item. Chi-square analysis revealed no statistically significant relationships among the variables of age ($p = 0.9925$, $df = 12$); years in practice ($p = 0.9787$, $df = 21$); dental specialty ($p = 0.7709$, $df = 24$); formal education on the principles of risk management ($p = 0.6392$, $df = 9$); and size of practice ($p = 0.6379$, $df = 6$).

Item 11 queried when the respondents documented the performed treatment in the Services Rendered Record. Seven percent responded that they document prior to performing the treatment, 22.3% indicated they documented during the treatment, 69% responded that they documented after performing the treatment, and 1.3% indicated that they documented at some other interval. Chi-square analysis revealed no statistically significant relationships when the respondents' age ($p = 0.8757$, $df = 4$); years in practice ($p = 0.6586$, $df = 7$); dental specialty ($p = 0.1048$, $df = 8$); and formal education on the principles of risk management ($p = 0.1297$, $df = 3$) were cross tabulated with the selection "prior to treatment" of item 11. No statistically significant results were obtained when cross tabulations

were performed between the selection "during treatment" and the respondents' age ($p = 0.1489$, $df = 4$); years in practice ($P = 0.2634$, $df = 7$); and formal education on the principles of risk management ($p = 0.5904$, $df = 3$). However, statistically significant results ($p = 0.0206$, $df = 8$) were revealed using the respondents' dental specialty. General practitioners and oral surgeons document during treatment more frequently than any other specialty, while the orthodontist is less likely to document during treatment. Chi-square analysis revealed no statistically significant relationships when the variables of age ($p = 0.2939$, $df = 8$), years in practice ($p = 0.4947$, $df = 14$), dental specialty ($p = 0.3165$, $df = 16$), and formal education on the principles of risk management ($p = 0.9256$, $df = 6$) were cross tabulated with the selection "after treatment" of item 11.

Item 12 indicated that 55.2% of the respondents have the dentist enter the performed services in the Services Rendered Record, 31.2% have the dental assistant enter the performed services, 7.9% have the dental receptionist enter the performed services, while 5.7% indicated that another individual enters the performed services. Chi-square analysis revealed data that was exhaustive and inconclusive; therefore, no relationship could be established.

Item 13 queried if respondents read and co-signed the documented services rendered by the dental hygienist or the

dental assistant. Many (45.3%) responded that they did read and co-sign the documented services, while 41.8% indicated that they did not read and co-sign the documented services. The remaining 11.8% indicated that item 13 was not applicable to their practice. Chi-square analysis revealed no relationship when cross tabulations were performed using the variables of age ($p = 0.5085$, $df = 12$), years in practice ($p = 0.7519$, $df = 21$), dental specialty ($p = 0.6787$, $df = 24$), size of dental practice ($p = 0.2253$, $df = 6$), and formal education on the principles of risk management ($p = 0.5076$, $df = 9$). The majority of respondents were between the ages of 30-49, had practiced between 10-14 years, were more likely to be general practitioners, oral surgeons, periodontists, and public health dentists, had not attended a risk management seminar, and were from average size practices.

Item 14 indicated that the majority (95.9%) of respondent's documented entries in the dental record were legible, while 2.4% indicated that the entries were not legible. The remaining 1.8% indicated that item 14 was not applicable to their practice. Cross tabulations or chi-square analysis were not performed on item 14.

Item 15 asked respondents which patient records are retained in their practices. The majority (52.2%) of respondents kept all active patient records, 44.6% retain all inactive patient records, and 3.2% responded to the

selection "other." Chi-square analysis revealed no statistically significant relationships when the variables of age ($p = 0.9733$, $df = 4$); years in practice ($p = 0.7599$, $df = 7$); dental specialty ($p = 0.9921$, $df = 8$); size of dental practice ($p = 0.4410$, $df = 2$); and formal education on the principles of risk management ($p = 0.7859$, $df = 3$) were cross tabulated with the selection "all active patients." No statistically significant results were obtained when cross tabulations were performed between the selection "all inactive patients" and the respondents' dental specialty ($p = 0.8314$, $df = 8$), and size of dental practice ($p = 0.1543$, $df = 2$). However, statistically significant results were obtained using the respondents' age ($p = 0.0333$, $df = 4$), years in practice ($p = 0.464$, $df = 7$), and formal education on the principles of risk management ($p = 0.0582$, $df = 3$). Dental practitioners that were between 40-49 years of age, had practiced between 10-19 years, and had attended a risk management seminar were more likely to retain all inactive patients records. Whereas, dental practitioners between 30-39 and 50 years or older, who practiced between 5-9 and 20-24 years, and who had not attended a risk management seminar were less likely to retain all inactive patient records.

Item 16 queried respondents regarding questions asked on the medical history form (see Figure 5). Data analysis revealed the percentage of respondents who asked the

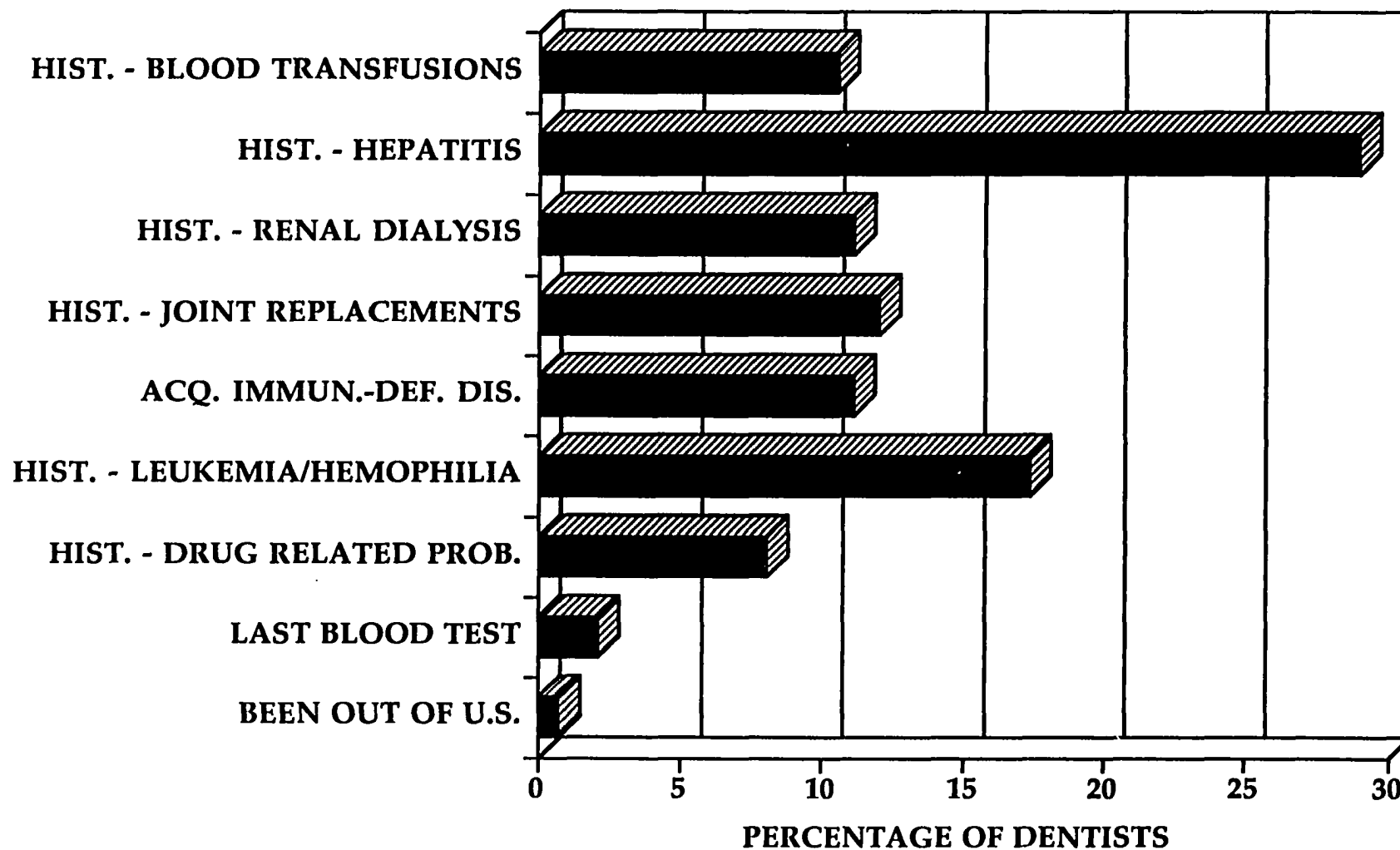


Figure 5. Questions asked by Virginia dentists on the medical/dental history form.

following:

. history of a blood transfusion	- 10.5%
. history of hepatitis	- 29.0%
. renal dialysis	- 11.1%
. joint replacements or implants	- 12.0%
. acquired immunodeficiency syndrome (AIDS)	- 11.1%
. history of leukemia or hemophilia	- 17.4%
. history of a drug-related problem	- 8.0%
. last blood test	- 2.1%
. have been out of the United States	- 0.7%

Chi-square analysis revealed no statistically significant relationships when cross tabulations were performed between the selection "history of blood transfusion" and the variables of age ($p = 0.6384$, $df = 4$), years in practice ($p = 0.4343$, $df = 7$), and size of dental practice ($p = 0.0784$, $df = 2$). However, statistically significant relationships were obtained using the variables of dental specialty ($p = 0.0017$, $df = 8$) and formal education on the principles of risk management ($p = 0.0185$, $df = 3$). Periodontists, pediatric dentists, and public health dentists who had attended a risk management seminar were least likely to ask patients about a history of blood transfusions. Chi-square analysis, using the respondents' dental specialty revealed no statistically significant relationships ($p = 0.6230$, $df = 8$) when cross tabulated with the selection "history of hepatitis" of item 16. However, analysis revealed statistically significant results using the variables of age ($p = 0.0004$, $df = 4$), years in practice ($p = 0.0035$, $df = 7$), size of dental practice ($p = 0.0338$, $df = 2$), and formal education on the principles of risk management ($p = 0.0045$,

df = 3). Respondents 50 years and older, who had practiced 25 years or more, were from a small size practice, and had not attended a risk management seminar were more likely to avoid the question about a history of hepatitis (see Table 4). Whereas, respondents who were between 30 and 39 years of age, had practiced between 10 and 19 years, were from large size practices, and attended a risk management seminar were more likely to question their patients about a history of hepatitis. Analysis, using the respondents' age ($p = 0.4855$, $df = 4$), years in practice ($p = 0.6945$, $df = 7$), size of dental practice ($p = 0.1533$, $df = 2$), and formal education on the principles of risk management ($p = 0.1501$, $df = 3$) revealed no statistically significant results when cross tabulated with the selection "history of renal dialysis" of item 16. However, analysis using the respondents' dental specialty revealed statistically significant results ($p = 0.0077$, $df = 8$), indicating that pediatric dentists were more likely to question their patients about renal dialysis; whereas, periodontists were less likely to question their patient about renal dialysis therapy. Chi-square analysis, using the respondents' age ($p = 0.8800$, $df = 4$), years in practice ($p = 0.2209$, $df = 7$), size of dental practice ($p = 0.4760$, $df = 2$), and formal education on the principles of risk management ($p = 0.1851$, $df = 3$) revealed no statistically significant results when cross tabulated with the selection "joint

TABLE 4
VIRGINIA DENTIST WHO DO NOT QUESTION PATIENTS
ON HISTORY OF HEPATITIS

	p - Value	df	Practitioner Group
AGE	0.0004	4	50 YRS OLD +
YEARS IN PRACTICE	0.0035	7	25 YRS +
SPECIALITY	0.6230	8	NO RELATIONSHIP
PRACTICE SIZE	0.0338	2	SMALL
RISK MANAGEMENT SEMINAR	0.0045	3	NO

replacements/implants." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0114$, $df = 8$) indicating that periodontists were more likely to ask their patients about joint replacements/implants; whereas, general practitioners were least likely to question their patient on joint replacement or implant. No statistically significant results were obtained using the respondents' age ($p = 0.4633$, $df = 4$), years in practice ($p = 0.7330$, $df = 7$), and size of dental practice ($p = 0.8632$, $df = 2$) when cross tabulated with the selection "AIDS." However, statistically significant relationships were obtained using the respondents' dental specialty ($p = 0.0137$, $df = 8$) and formal education on the principles of risk management ($p = 0.0489$, $df = 3$). Oral surgeons who had attended a risk management seminar were more likely to question their patients about AIDS; whereas, orthodontists who had not attended a risk management seminar were least likely to question their patients about AIDS. Analysis, using the respondents' age ($p = 0.1959$, $df = 4$), years in practice ($p = 0.9183$, $df = 7$), dental specialty ($p = 0.8141$, $df = 2$), and formal education on the principles of risk management ($p = 0.2340$, $df = 3$) revealed no statistically significant results when cross tabulated with the selection "history of leukemia or hemophilia." No statistically significant results were obtained when the variables of age ($p = 0.9032$, $df = 4$), years in practice (p

= 0.6612, $df = 7$), size of dental practice ($p = 0.0809$, $df = 2$), and formal education on the principles of risk management ($p = 0.0655$, $df = 3$) were cross tabulated with the selection "history of drug related problems." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0038$, $df = 8$); indicating that periodontists were more likely to question their patients on a history of drug related problems; whereas, public health dentists were least likely to ask their patients about drug related problems. Analysis revealed no statistically significant results when the respondents' age ($p = 0.0714$, $df = 4$), dental specialty ($p = 0.5170$, $df = 8$), size of dental practice ($p = 0.7398$, $df = 2$), and formal education on the principles of risk management ($p = 0.2182$, $df = 3$) were cross tabulated with the selection "last blood test" of item 16. However, statistically significant results were obtained using the respondents' years in practice ($p = 0.0285$, $df = 7$), indicating that dental practitioners that practiced 25 years or more were most likely to ask their patients the date of their last blood test; whereas, practitioners that had practiced between 2-4 years were least likely to ask their patient about blood tests. Analysis using the respondents' age ($p = 0.9850$, $df = 4$), years in practice ($p = 0.9374$, $df = 7$), dental specialty ($p = 0.2812$, $df = 8$), size of dental practice ($p = 0.5215$, $df = 2$), and formal education on the

principles of risk management ($p = 0.9606$, $df = 3$) revealed no statistically significant results when cross tabulated with the selection "out of the United States."

Item 17 asked respondents to identify when they require a recent blood test to confirm negative results for AIDS and hepatitis B. The analysis revealed the following conditions that require a blood test:

. Hemophiliacs	13.2%
. Blood transfused patients	9.9%
. Renal dialysis patients	9.4%
. Leukemia patients	7.1%
. None of the above	56.6%
. Other	3.8%

Chi-square analysis revealed no statistically significant results when cross tabulations were performed between the selection "hemophiliacs" and the respondents' age ($p = 0.1781$, $df = 4$), size of dental practice ($p = 0.2993$, $df = 2$), and formal education on the principles of risk management ($p = 0.2948$, $df = 3$). A relationship was determined between the respondents' years in practice ($p = 0.0060$, $df = 7$), dental specialty ($p = 0.0499$, $df = 8$) and item 17. Pediatric dentists are more likely to ask their hemophiliac patients for a blood test than any other dental specialty. Additionally, dental practitioners who have practiced one year or less are more likely to require a recent blood test from hemophiliacs to confirm negative results to AIDS or hepatitis B. Analysis using the respondents' age ($p = 0.2881$, $df = 4$), size of dental

practice ($p = 0.0765$, $df = 2$), and formal education on the principles of risk management ($p = 0.2813$, $df = 3$) revealed no statistically significant results when cross tabulated with the selection "blood transfused patients." However, statistically significant results were obtained using the respondents' years in practice ($p = 0.0049$, $df = 7$) and dental specialty ($p = 0.0086$, $df = 8$), indicating that pediatric dentists, as well as dental practitioners who have practiced one year or less were more likely to ask blood transfused patients for a recent blood test than any other dental specialty or year group. Chi-square analysis revealed no statistically significant results when the variables of age ($p = 0.8452$, $df = 4$), years in practice ($p = 0.0912$, $df = 7$), dental specialty ($p = 0.8385$, $df = 8$), size of dental practice ($p = 0.1860$, $df = 2$), and formal education on the principles of risk management ($p = 0.4041$, $df = 3$) were cross tabulated with the selection "renal dialysis patient" of item 17. No statistically significant results were obtained when the variables of age ($p = 0.1785$, $df = 4$), years in practice ($p = 0.1309$, $df = 7$), dental specialty ($p = 0.3481$, $df = 8$), size of dental practice ($p = 0.2527$, $df = 2$), and formal education on the principles of risk management ($p = 0.6212$, $df = 3$) were cross tabulated with the selection "leukemia patient" of item 17. Analysis, using the respondents' age ($p = 0.2143$, $df = 4$), dental specialty ($p = 0.4191$, $df = 8$), size of dental practice ($p =$

0.2573, $df = 2$), and formal education on the principles of risk management ($p = 0.3839$, $df = 3$) revealed no statistically significant results when cross tabulated with the selection "none of the above" of item 17. However, analysis did reveal statistically significant results using the respondents' years in practice ($p = 0.0429$, $df = 7$), indicating a relationship with item 17. Dental practitioners who have practiced one year or less are most likely to ask patients for a recent blood test to confirm negative results for AIDS or hepatitis than any other year group.

Item 18 revealed the percentage of respondents who premedicated patients with organic heart murmurs (16.5%), functional heart murmurs (10.8%), full joint(s) replacement (14.4%), prosthetic cardiac valves patients (18.1%), rheumatic dysfunctions (17.5%), mitral valve prolapse (18.0%), lupus erythematosus (3.2%), and 1.5% responded to the selection "other" of item 18 (see Figure 6). Chi-square analysis revealed no statistically significant results when the variables of age ($p = 0.1248$, $df = 4$), years in practice ($p = 0.1593$, $df = 7$), dental specialty ($p = 0.8561$, $df = 8$), size of dental practice ($p = 0.6105$, $df = 2$), and formal education on the principles of risk management ($p = 0.2401$, $df = 3$) were cross tabulated with the selection "organic heart murmur" of item 18. Therefore, no relationship was interpreted. Analysis using

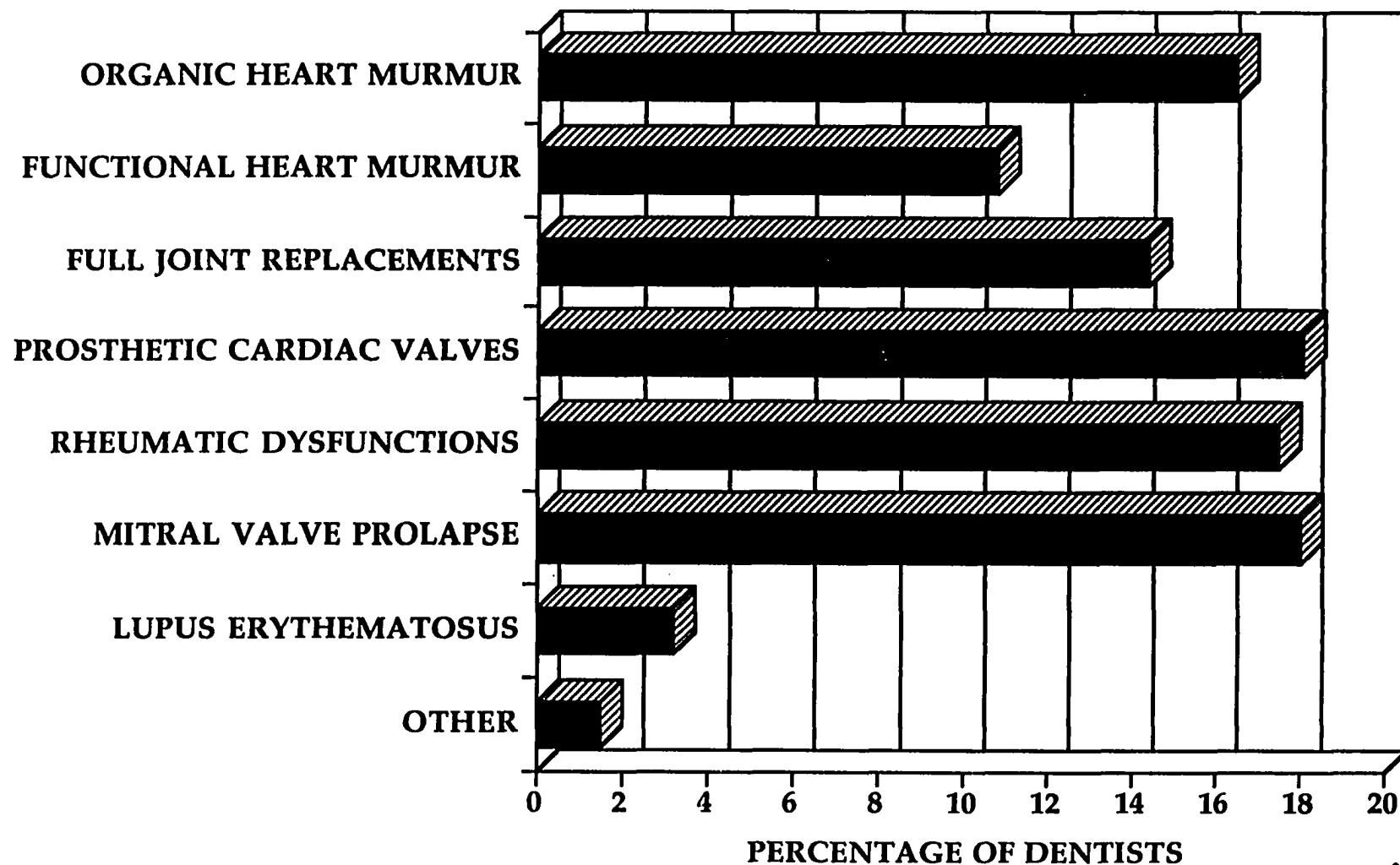


Figure 6. Various medical conditions for which Virginia dentists premedicate patients.

the respondents age ($p = 0.8915$, $df = 8$), years in practice ($p = 0.6199$, $df = 14$), dental specialty ($p = 0.4966$, $df = 16$), size of dental practice ($p = 0.9417$, $df = 4$), and formal education on the principles of risk management ($p = 0.7786$, $df = 6$) yielded no statistically significant relationship when cross tabulated with the selection "functional heart murmur." Statistically significant results were obtained when the variables of age ($p = 0.0118$, $df = 4$), years in practice ($p = 0.0491$, $df = 7$), size of dental practice ($p = 0.0030$, $df = 2$), and formal education on the principles of risk management ($p = 0.0534$, $df = 3$) were cross tabulated with the selection "full joint replacement" of item 18 (see Table 5). The data revealed that the respondents who do not premedicate patients with full joint(s) replacement were 50 years and older, had practiced 25 years or more, were from small size ($n < 2$) practices, and had not attended a risk management seminar. No relationship can be interpreted using the variable of dental specialty ($p = 0.2929$, $df = 8$). No statistically significant results were obtained when the variables of dental specialty ($p = 0.7470$, $df = 8$) and formal education on the principles of risk management ($p = 0.2266$, $df = 3$) were cross tabulated with the selection "prosthetic cardiac valves" of item 18. However, statistically significant relationships resulted using the respondents' age ($p = 0.0519$, $df = 4$), years in practice ($p = 0.0347$, $df = 7$), and

TABLE 5
VIRGINIA DENTISTS WHO DO NOT PREMEDICATE
PATIENTS WITH FULL JOINT REPLACEMENTS

	p - Value	df	Practitioner Group
AGE	0.0118	4	50 YRS OLD +
YEARS IN PRACTICE	0.0491	7	25 YRS +
SPECIALITY	0.2929	8	NO RELATIONSHIP
PRACTICE SIZE	0.0030	2	SMALL
RISK MANAGEMENT SEMINAR	0.0534	3	NO

size of dental practice ($p = 0.0234$, $df = 2$), indicating that respondents who do not premedicate patients with prosthetic cardiac valves were 50 years and older, had practiced between 20 and 24 years, and were from small size practices ($n < 2$) (see Table 6). Analysis using the respondents' age ($p = 0.2227$, $df = 4$), years in practice ($p = 0.5618$, $df = 7$), dental specialty ($p = 0.4661$, $df = 8$), and size of dental practice ($p = 0.4368$, $df = 2$) yielded no statistically significant results when cross tabulated with the selection "rheumatic dysfunctions" of item 18. However, data revealed significant results using the variable of formal education on the principles of risk management ($p = 0.4368$, $df = 2$), indicating that dental practitioners who do not premedicate patients with rheumatic dysfunctions had not attended a risk management seminar. No statistically significant results were obtained when the variables of age ($p = 0.0632$, $df = 4$), years in practice ($p = 0.1153$, $df = 7$), dental specialty ($p = 0.07308$, $df = 8$), and formal education on the principles of risk management ($p = 0.0786$, $df = 3$) were cross tabulated with the selection "mitral valve prolapse." However, significant results were obtained using the respondents' size of practice ($p = 0.0077$, $df = 2$), indicating that respondents who do not premedicate patients with mitral valve prolapse were from small size dental practices ($n < 2$). Analysis revealed no statistically significant results when cross tabulations

TABLE 6
VIRGINIA DENTISTS WHO DO NOT PREMEDICATE
PATIENTS WITH PROSTHETIC CARDIAC VALVES

	p - Value	df	Practitioner Group
AGE	0.0519	4	50 YRS OLD +
YEARS IN PRACTICE	0.0347	7	20 - 24 YRS
SPECIALITY	0.7476	8	NO RELATIONSHIP
PRACTICE SIZE	0.0234	2	SMALL
RISK MANAGEMENT SEMINAR	0.2266	3	NO RELATIONSHIP

were performed among the selection "lupus erythematosus" and the respondents' age ($p = 0.4205$, $df = 4$), years in practice ($p = 0.2462$, $df = 7$), dental specialty ($p = 0.2267$, $df = 8$), size of dental practice ($p = 0.3845$, $df = 2$), and formal education on the principles of risk management ($p = 0.1089$, $df = 3$). Consequently, no relationship was interpreted.

Item 19 queried respondents as to when they take blood pressure measurements in their office (see Figure 7). The data revealed the following:

. Only patients reporting high blood pressure	22.9%
. Only patients reporting cardiac conditions	12.2%
. At every recall appointment	10.7%
. At every appointment	3.7%
. Once a year	3.3%
. Starting at 12-years-old and up	.7%
. Starting at 20-years-old and up	5.9%
. Starting at 40-years-old and up	1.1%
. During certain procedures as a monitoring device	17.0%
. Never	12.9%
. Other	9.6%

Chi-square analysis using the respondents' age ($p = 0.4557$, $df = 4$), years in practice ($p = 0.1219$, $df = 7$), dental specialty ($p = 0.2549$, $df = 8$), size of dental practice ($p = 0.9787$, $df = 2$), and formal education on the principles of risk management ($p = 0.5462$, $df = 3$) revealed no statistically significant relationships when cross tabulated with the selection "patients reporting high blood pressure" of item 19. No relationship was interpreted among the selection "patients reporting cardiac condition" and the

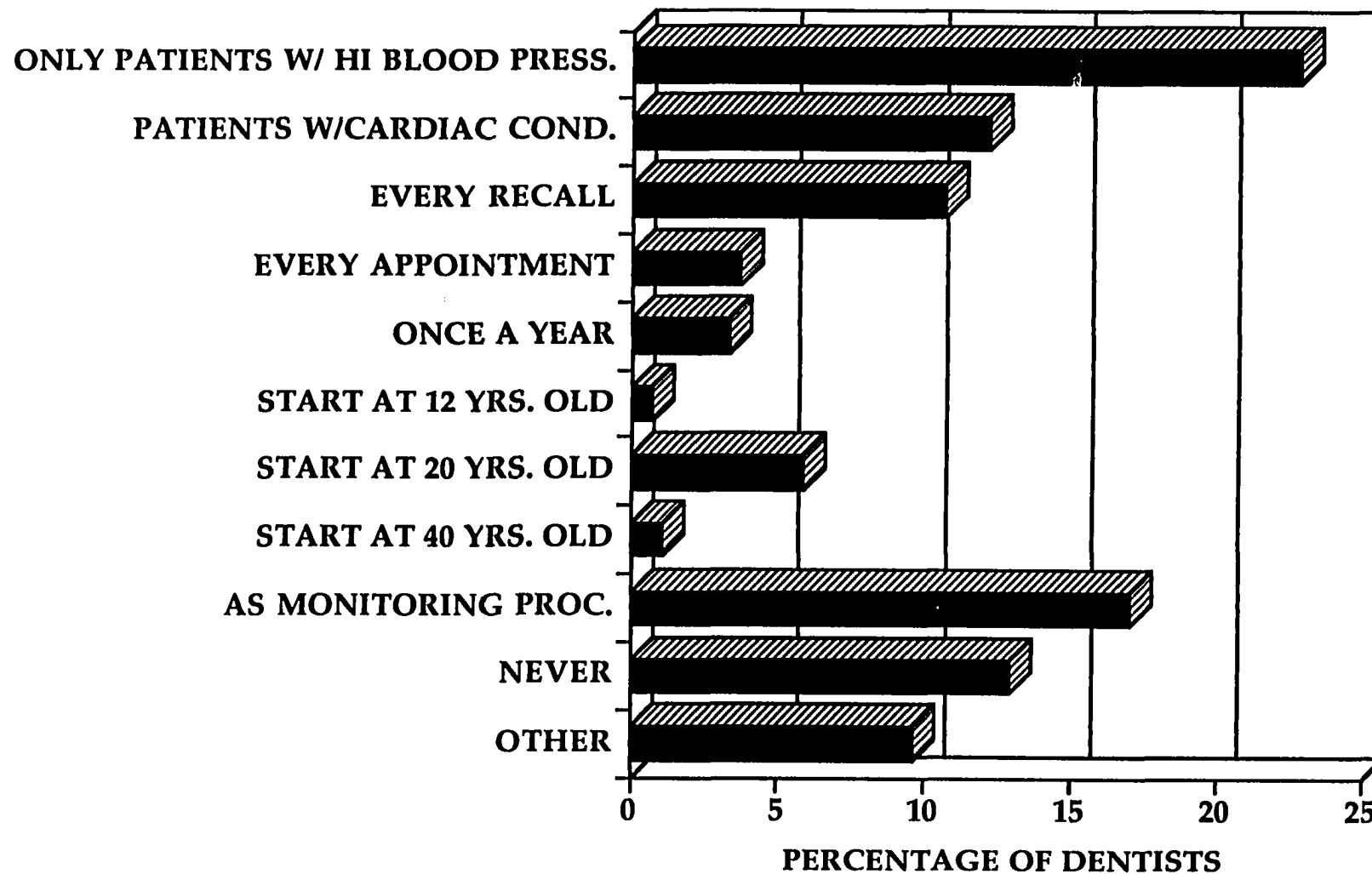


Figure 7. Conditions under which Virginia dentists record blood pressure measurements.

variables of age ($p = 0.5945$, $df = 4$), years in practice ($p = 0.2503$, $df = 7$), dental specialty ($p = 0.6236$, $df = 8$), size of dental specialty ($p = 0.3688$, $df = 2$), and formal education on the principles of risk management ($p = 0.8887$, $df = 3$). No relationship was made between the selection "every recall appointment" and the variables of age ($p = 0.3927$, $df = 4$), dental specialty ($p = 0.7878$, $df = 8$), size of dental practice ($p = 0.1954$, $df = 2$), and formal education on the principles of risk management ($p = 0.5202$, $df = 3$). However, analysis did reveal statistically significant results using the respondents' years in practice ($p = 0.0119$, $df = 7$), indicating that respondents more likely to take blood pressure measurements at every recall appointment practiced between 2-4 years. No statistically significant results were obtained when the respondents' age ($p = 0.8377$, $df = 4$), years in practice ($p = 0.7971$, $df = 7$), size of dental practice ($p = 0.7484$, $df = 2$), and formal education on the principles of risk management ($p = 0.8565$, $df = 3$). However, significant results were obtained using the respondents' dental specialty ($p = 0.0051$, $df = 8$), indicating a relationship with item 19. Oral surgeons were more likely to take blood pressure readings at every appointment than any other dental specialty. No relationship can be interpreted among the selection "once a year" and the variables of age ($p = 0.7061$, $df = 4$), years in practice ($p = 0.1257$, $df = 7$), size of dental practice ($p = 0.6060$, $df =$

2), and formal education on the principles of risk management ($p = 0.7302$, $df = 3$). However, analysis did reveal significant results using the respondents' dental specialty ($p = 0.0000$, $df = 8$), indicating that periodontists were more likely to take annual blood pressure readings than any other dental specialty. Analysis using the respondents' age ($p = 0.2060$, $df = 4$) and years in practice ($p = 0.2733$, $df = 7$) revealed no statistically significant results when cross tabulated with the selection "during certain procedures" of item 19. A relationship was revealed using the respondents' dental specialty ($p = 0.0195$, $df = 8$), size of dental practice ($p = 0.0381$, $df = 2$), and formal education on the principles of risk management ($p = 0.0446$, $df = 3$). Respondents more likely to take blood pressure measurements during certain procedures were periodontists, from small ($n < 2$) or large ($n > 10$) size practices, and who had attended a risk management seminar. Chi-square analysis revealed no statistically significant results when the respondents' age ($p = 0.1501$, $df = 4$), years in practice ($p = 0.1114$, $df = 7$), size of dental practice ($p = 0.7693$, $df = 2$), and formal education on the principles of risk management ($p = 0.1681$, $df = 3$) were cross tabulated with the selection "never" of item 19. However, analysis did reveal significant results using the respondents' dental specialty ($p = 0.0120$, $df = 8$), indicating that orthodontists were least likely to take blood pressure

measurements than any other dental specialist. The selections "12-years-old and up;" "20-years-old and up;" "40-years-old and up;" and "other" of item 19 revealed data that was inconclusive.

Item 20 determined respondents who performs the intra- and extra-oral examination. The majority (66.5%) indicated that the dentist performs the intra- and extra-oral examination, 29.4% indicated the dental hygienist performs the exam, while 3.2% indicated the dental assistant performs the exam. Cross tabulations were performed using the variables of age, years in practice, dental specialty, size of dental practice, and formal education on the principles of risk management. Cross tabulations revealed that of the respondents who indicated the dentist performs the intra- and extra-oral examination, 41.1% were between 30-39 years of age, had practiced between 10-14 years, were more likely to be general practitioners (79.4%), orthodontists (5%) and periodontists (5%), were from average size ($2 < n < 10$) dental practices (76.4%), and had not attended a risk management seminar. The respondents who indicated the hygienist performs the examination were between 30-39 years of age (43.8%), had practiced 5-9 years (24.7%), were more likely to be general practitioners (91.5%) and periodontists (7.0%), were from average size ($2 < n < 10$) practices (83.6%), and had not attended a risk management seminar. The respondents who indicated the dental assistant performs the

intra- and extra-oral examination were between 40-49 years of age (50%); had practiced between 10-14 years (75%); were more likely to be general practitioners (75%), orthodontists (12.5%), and periodontists (12.5%); were from average size ($2 < n < 10$) practices (87.5%); and had attended a risk management seminar (50%). Chi-square analysis was not performed on item 20.

Item 21 determined as to how errors were corrected on the dental record. The majority (61.5%) indicated that they draw a straight line through the errors; 5.3% erase the errors from the dental record; 12.9% scratch through the errors; 10.1% use "Wite Out" on the errors; while 8.7% indicated they do not remove the error from the record. Cross tabulations using the variables of age, years in practice, dental specialty, size of dental practice, and formal education on the principles of risk management revealed that of the respondents who erase the errors from the dental records, 45.5% were between 30-39 years of age, had practiced between 10-14 years (36.4%), were more likely to be general practitioners (90%) and orthodontists (10%), were from average size ($2 < n < 10$) practices (72.7%), and had either attended (50%) or not attended (50%) a risk management seminar. Those respondents who indicated the errors were scratched from the dental records were between 30-39 years of age (32%), had practiced 10-14 years (32%), were more likely to be general practitioners (92%) and

orthodontists (8%), were from average size ($2 < n < 10$) practices (80%), and had not attended a risk management seminar (89%). The respondents who indicated they use "Wite out" on the errors were 50 years and older (47.6%); had practiced 25 years or more (33.3%); were more likely to be general practitioners (81%), orthodontists (9.5%), pediatric dentists (4.8%), and periodontists (4.8%); were from average size ($2 < n < 10$) practices (71.4%); and had not attended a risk management seminar (66.7%). Of the respondents who draw straight lines through the errors, 43.7% were between 30-39 years of age; had practiced between 5-9 years (22.8%); were more likely to be general practitioners (79%), orthodontists (4.8%), and periodontists (6.5%); were from average size ($2 < n < 10$) dental practices (73.4%); and had not attended a risk management seminar (57.9%). The respondents who do not remove the errors from the dental record were 50 years and older (44.4%); had practiced between 10-14 years (35.3%); were more likely to be general practitioners (52.9%), oral surgeons (23.5%), and orthodontists (11.8%); were from average size ($2 < n < 10$) practices (100%); and had attended a risk management seminar (61.1%). Chi-square analysis was not performed on item 21.

Research Question Two

Are infection control procedures used to reduce the risk of disease transmission? Questionnaire items 22-36 provided information relative to this question.

Overall responses ($n = 170$) to item 22 indicated that the majority of the respondents (79%) wear safety glasses during the treatment of every patient, 10.8% wear safety glasses when the medical/dental history indicates the need, while 10.2% do not wear safety glasses. Chi-square analysis revealed no statistically significant results when the respondents' age ($p = 0.3542$, $df = 4$), years in practice ($p = 0.1630$, $df = 7$), and formal education on the principles of risk management ($p = 0.6940$, $df = 3$) were cross tabulated with the selection "during the treatment of every patient." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0137$, $df = 8$) and size of dental practice ($p = 0.0548$, $df = 2$), indicating that respondents who do not wear safety glasses during the treatment of every patient were more likely to be orthodontists and from small size ($n < 2$) dental practices. No relationship was revealed when the variables of age ($p = 0.1971$, $df = 4$), years in dental practice ($p = 0.4591$, $df = 7$), dental specialty ($p = 0.8618$, $df = 8$), size of dental practice ($p = 0.4025$, $df = 2$), and formal education on the principles of risk management ($p = 0.1066$, $df = 3$) were cross tabulated with the selection "only when medical/dental history indicates the need." Analysis using the respondents' age ($p = 0.6640$, $df = 4$), years in practice ($p = 0.3848$, $df = 7$), size of the dental practice ($p = 0.7794$, $df = 2$), and formal education on the principles of risk

management ($p = 0.5726$, $df = 3$) revealed no statistically significant results when cross tabulated with the selection "do not wear safety glasses." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0013$, $df = 8$), indicating that orthodontists were least likely to wear safety glasses of any dental specialist.

Item 23 indicated that the majority (65.3%) of the respondents wear face masks during the treatment of every patient, 22.4% wear face masks when the medical/dental history indicates the need, while 12.4% do not wear face masks. Chi-square analysis revealed no statistically significant results when the respondents' size of the dental practice ($p = 0.2758$, $df = 2$) and formal education on the principles of risk management ($p = 0.5933$, $df = 3$) were cross tabulated with the selection "during the treatment of every patient." However, statistically significant results were obtained using the respondents' age ($p = 0.0066$, $df = 4$), years in practice ($p = 0.0043$, $df = 8$), and dental specialty ($p = 0.0066$, $df = 7$), indicating that the respondents who do not wear face masks during the treatment of every patient were more likely to be 50 years and older, had practiced 25 years or more, and were orthodontists. No relationship can be established among the variables of age ($p = 0.1037$, $df = 4$), years in practice ($p = 0.1122$, $df = 7$), dental specialty ($p = 0.3390$, $df = 8$), size of the

dental practice ($p = 0.7014$, $df = 2$), and formal education on the principles of risk management ($p = 0.1210$, $df = 3$) and the selection "only when medical/dental history indicates the need." Analysis revealed no statistically significant results when the respondents' age ($p = 0.6929$, $df = 4$), years in practice ($p = 0.8391$, $df = 7$), size of the dental practice ($p = 0.4821$, $df = 2$), and formal education on the principles of risk management ($p = 0.3795$, $df = 3$) were cross tabulated with the selection "do not wear face masks." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0034$, $df = 8$), indicating that orthodontists were least likely to wear face masks.

Item 24 indicated that the majority (80.2%) of dentists wear gloves during the treatment of every patient, 14.4% only wear gloves when the medical/dental history indicates the need, while 5.4% do not wear gloves. Chi-square analysis revealed no statistically significant relationships between glove wearing and the respondents' dental specialty ($p = 0.4621$, $df = 8$), size of the dental practice ($p = 0.5228$, $df = 2$), and formal education on the principles of risk management ($p = 0.9106$, $df = 3$). However, a relationship was identified using the respondents' age ($p = 0.0009$, $df = 4$) and years in dental practice ($p = 0.0000$, $df = 7$). The respondents who indicated they do not wear gloves during the treatment of every patient were 50 years and

older and had practiced for 25 years or more. No statistically significant results were obtained using the respondents' dental specialty ($p = 0.6466$, $df = 8$), size of the dental practice ($p = 0.9919$, $df = 2$), and formal education on the principles of risk management ($p = 0.7827$, $df = 3$); however, statistically significant results were obtained when the respondents' age ($p = 0.0214$, $df = 4$) and years in practice ($p = 0.0148$, $df = 7$) were cross tabulated with the selection "only when the medical/dental history indicates the need." The respondents more likely to wear gloves only when the medical/dental history indicates the need were 50 years and older and had practiced 25 years or more. Analysis revealed no relationship when the variables of age ($p = 0.3144$, $df = 4$), years in practice ($p = 0.3204$, $df = 7$), dental specialty ($p = 0.9499$, $df = 8$), size of the dental practice ($p = 0.3922$, $df = 2$), and formal education on the principles of risk management ($p = 0.9443$, $df = 3$) were cross tabulated with the selection "do not wear gloves."

Item 25 indicated that the majority (73.3%) of the respondents change their gloves with every patient, 8.7% change their gloves once every hour, 5.8% change their gloves only when the medical/dental history indicated a need, 2.3% stated they use one set of gloves in the A.M. and one set in the P.M., and 9.9% change their gloves at some other interval. Chi-square analysis revealed no

statistically significant results when the respondents' age ($p = 0.3794$, $df = 4$), years in practice ($p = 0.2886$, $df = 7$), size of the dental practice ($p = 0.7965$, $df = 2$), and formal education on the principles of risk management ($p = 0.9328$, $df = 3$) were cross tabulated with the selection "every patient." However, statistically significant results using the respondents' dental specialty ($p = 0.0422$, $df = 8$) indicated that orthodontists were least likely to change gloves on every patient. The remaining selections of item 25 yielded data that were inconclusive.

Item 26 asked dentists to describe their handwashing routine (see Figure 8). Most (25.2%) indicated they wash their hands prior to gloving, 19.4% wash their hands before every patient, 13.8% wash their hands between each patient, 19.1% wash their hands after each patient, while 21.7% wash their hands after removing their gloves. Chi-square analysis revealed no relationship between handwashing prior to gloving and the respondents' age ($p = 0.6103$, $df = 4$), years in practice ($p = 0.7553$, $df = 7$), dental specialty ($p = 0.4646$, $df = 8$), size of the dental practice ($p = 0.7693$, $df = 2$), and formal education on the principles of risk management ($p = 0.1387$, $df = 3$). No statistically significant results were obtained when the respondents' age ($p = 0.2467$, $df = 4$), years in practice ($p = 0.7803$, $df = 7$), dental specialty ($p = 0.2378$, $df = 8$), and size of dental practice ($p = 0.1984$, $df = 2$) were cross tabulated

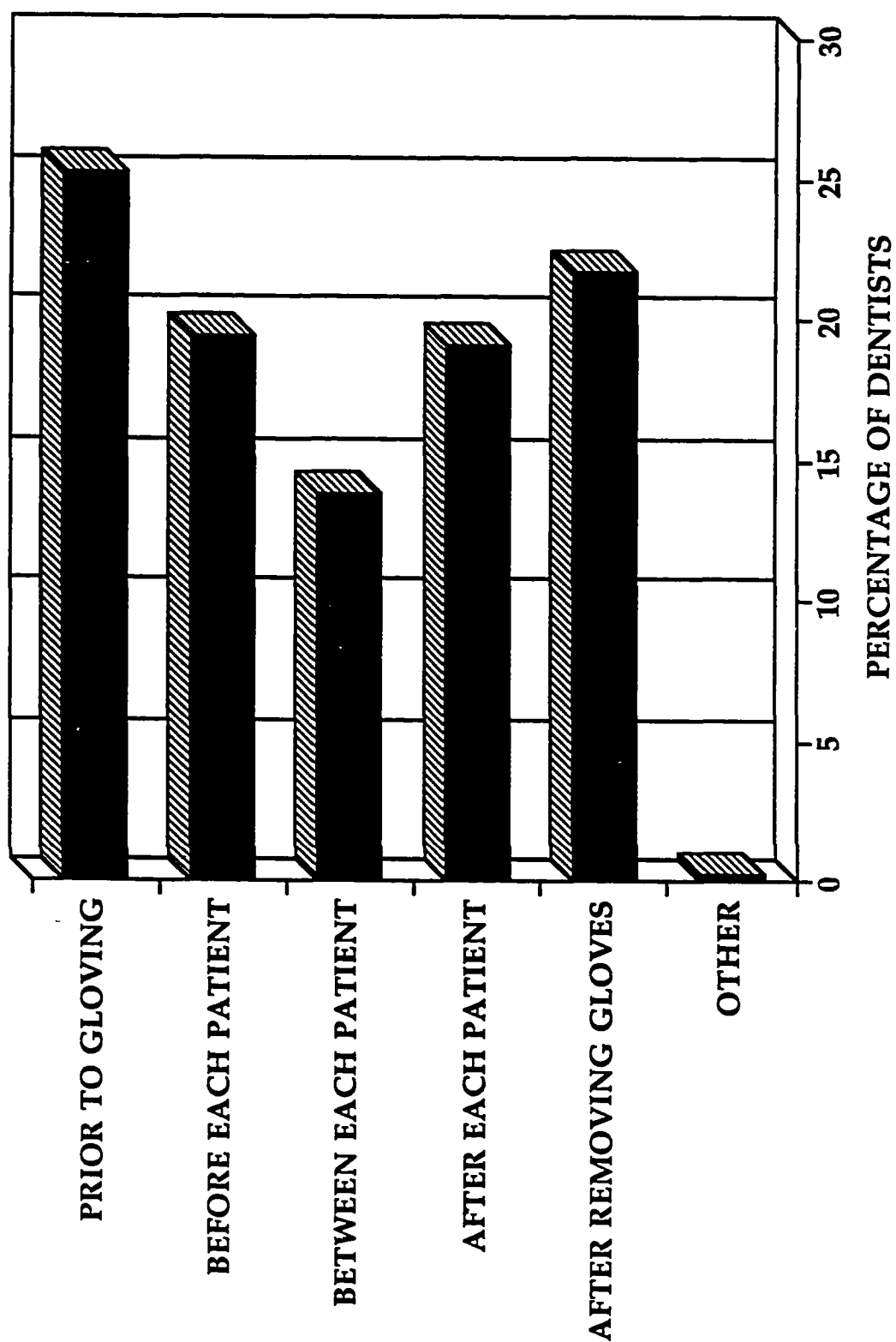


Figure 8. Handwashing techniques used by Virginia dentists.

with the selection "before each patient." However, statistically significant results were obtained using the respondents' formal education on the principles of risk management ($p = 0.0431$, $df = 3$), indicating that respondents who do not wash their hands before each patient had not attended a risk management seminar. No statistically significant results were obtained using the variables of age ($p = 0.3978$, $df = 4$), years in practice ($p = 0.6136$, $df = 7$), dental specialty ($p = 0.3325$, $df = 8$), and size of the dental practice ($p = 0.0896$, $df = 2$) when cross tabulated with the selection "after each patient." However, a relationship was established between the variables formal education on the principles of risk management ($p = 0.0025$, $df = 3$) and handwashing. Respondents who do not wash their hands after each patient had not attended a risk management seminar; those respondents who do wash their hands after every patient had attended a risk management seminar. No statistically significant results were obtained when the variables of dental specialty ($p = 0.3530$, $df = 8$), size of the dental practice ($p = 0.8781$, $df = 2$), and formal education on the principles of risk management ($p = 0.0890$, $df = 3$) were cross tabulated with the selection "after removing gloves." However, a relationship was observed using the variables of age ($p = 0.0485$, $df = 4$) and years in practice ($p = 0.0324$, $df = 7$). The respondents least likely to wash their hands after removing their gloves were 50

years and older and practiced 25 years or more. Conversely, the respondents most likely to wash after removing their gloves were between 30-39 years of age and practiced between 5-9 years.

From item 27, results indicated that 32.4% of the dentists, 54.7% of the dental assistants, 10.6% of the dental hygienists, and 1.8% of the dental receptionists received the hepatitis B vaccine while 0.6% had no one in the office vaccinated. Five separate cross tabulations were performed. The first analysis, using the respondents' age, revealed no relationship with item 27 ($p = 0.1606$, $df = 16$). The second analysis, using the respondents' years in practice, yielded statistically significant results ($p = 0.0207$, $df = 28$), indicating that dental practitioners who practiced 25 years or more were more likely to have a dental receptionist that had the hepatitis B vaccine than any other year group. The third analysis, using the respondents' dental specialty yielded statistically significant results ($p = 0.0101$, $df = 32$), indicating a relationship with item 27. Periodontists were more likely to have dental receptionists who had the hepatitis B vaccine than any other dental specialty. The fourth analysis, using the respondents' size of the dental practice, yielded statistically significant results ($p = 0.0005$, $df = 8$), indicating that larger practices were more likely to have dental receptionists who had the hepatitis B vaccine. The

fifth analysis, using the respondents' formal education on the principles of risk management, indicated that the variables were not related; however, direct observation suggests that of the respondents who indicated their dental receptionist had the hepatitis B vaccine (1.8%), all of the respondents had attended a risk management seminar.

Item 28 indicated that prior to sterilization, the majority (45.4%) of the respondents scrub instruments; 27.9% use the ultrasonic to clean instruments; 25.1% soak instruments; while 0.6% do none of the above procedures prior to sterilization; 1.2% stated they use some other technique prior to sterilization. Chi-square analysis revealed no statistically significant results when the respondents' age ($p = 0.8642$, $df = 4$), years in practice ($p = 0.5333$, $df = 7$), dental specialty ($p = 0.6831$, $df = 8$), size of the dental practice ($p = 0.9949$, $df = 2$), and formal education on the principles of risk management ($p = 0.3313$, $df = 3$) were cross tabulated with the selection "scrubbing." Analysis using the respondents' age ($p = 0.1180$, $df = 4$), dental specialty ($p = 0.0752$, $df = 8$), and formal education on the principles of risk management ($p = 0.0773$, $df = 3$) resulted in no statistically significant results when cross tabulated with the selection "ultrasonic cleaning." However, statistically significant results were obtained using the respondents' years in practice ($p = 0.0431$, $df = 7$) and size of the dental practice ($p = 0.0080$, $df = 2$),

indicating that of the respondents who do not use the ultrasonic cleaner prior to sterilization, the majority practiced 25 years or more, and were more likely to be from small size ($n < 2$) practices.

Item 29 indicated that when scrubbing instruments, 39.6% of the respondents use examination gloves, 11.5% use surgical gloves, 30.8% use heavy duty gloves, 2.2% do not scrub the instruments, 12.6% stated they do not wear any gloves, and 3.3% use another type of glove or technique. Chi-square analysis revealed no statistically significant results when the respondents' age ($p = 0.0809$, $df = 4$), years in practice ($p = 0.0755$, $df = 7$), and size of dental practice ($p = 0.0767$, $df = 2$) were cross tabulated with the selection "examination glove." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0147$, $df = 8$) and formal education on the principles of risk management ($p = 0.0347$, $df = 3$), indicating that pediatric dentists were more inclined to use examination gloves while scrubbing the dental instruments than any other dental specialty. Additionally, those who do wear examination gloves when scrubbing instruments had not attended a risk management seminar; the majority who do not wear examination gloves had been to a risk management seminar. Analysis using the respondents' age ($p = 0.4240$, $df = 4$), years in practice ($p = 0.5554$, $df = 7$), dental specialty ($p = 0.5616$, $df = 8$), and size of the dental

practice ($p = 0.5147$, $df = 2$) yielded no statistically significant results when cross tabulated with the selection "surgical gloves." However, statistically significant results were obtained using the variable, formal education on the principles of risk management ($p = 0.0198$, $df = 3$), indicating that the majority of the respondents who wear surgical gloves when scrubbing instruments had not attended a risk management seminar. No relationship can be established when the respondents' age ($p = 0.5765$, $df = 4$) and years in practice ($p = 0.2568$, $df = 7$) were cross tabulated with the selection "heavy duty gloves." However, a relationship was established using the respondents' dental specialty ($p = 0.0084$, $df = 8$), size of the dental practice ($p = 0.0510$, $df = 2$), and formal education on the principles of risk management ($p = 0.0016$, $df = 3$). Periodontists were more likely to wear heavy duty gloves when scrubbing instruments than any other specialty. Respondents from small practices who have not attended a risk management seminar were least likely to wear heavy duty gloves while scrubbing dental instruments. Analysis using the respondents' age ($p = 0.5984$, $df = 4$), years in practice ($p = 0.7677$, $df = 7$), dental specialty ($p = 0.8758$, $df = 8$), and formal education on the principles of risk management ($p = 0.9606$, $df = 3$) revealed no statistically significant results when cross tabulated with the selection "do not scrub instruments." However, statistically significant

results were obtained using the respondents' size of the dental practice ($p = 0.0508$, $df = 2$), indicating that respondents from large ($n > 10$) practices were least likely to scrub instruments than other size practices.

Item 30 indicated that prior to sterilization, 47.3% of the respondents package the instruments in autoclave bags; 7.1% use paper towels to wrap the instruments; 3.1% use muslin bags; 30.8% do not package the instruments; and 1.8% use another instrument packaging technique. Chi-square analysis revealed no statistically significant results when the respondents' dental specialty ($p = 0.1523$, $df = 8$) and formal education on the principles of risk management ($p = 0.4166$, $df = 3$) were cross tabulated with the selection "autoclave bags." However, significant results were obtained using the respondents' age ($p = 0.0041$, $df = 4$) and years in practice ($p = 0.0055$, $df = 2$), indicating that respondents less likely to use autoclave bags were 50 years or older, had practiced 25 years or more, and were from small size practices. No statistically significant results were obtained when the respondents' age ($p = 0.5103$, $df = 3$), years in practice ($p = 0.1262$, $df = 7$), and formal education on the principles of risk management ($p = 0.6625$, $df = 3$) were cross tabulated with the selection "not packaged." However, statistically significant results were obtained using the variables of dental specialty ($p = 0.0572$, $df = 8$) and size of the dental practice ($p = 0.0519$,

df = 2), indicating that pediatric dentists were more likely to package than not package the dental instruments prior to sterilization. Additionally, respondents from large size ($n > 10$) practices were more likely to not package than to package instruments prior to sterilization.

Item 31 indicated that to sterilize instruments, 50% of respondents use steam under pressure, 8.4% use dry heat, 5.2% use chemical vapor, 31.8% use glutaraldehyde, 3.1% use quaternary ammonium compounds while 1.4% use another method (see Figure 9). Cross tabulations were performed using the variables of age, years in practice, dental specialty, size of dental practice, and formal education on the principles of risk management. Respondents who indicated they use dry heat to sterilize the dental instruments were between 40-49 years of age (37.5%), had practiced between 10-14 years (41.7%), were more likely to be general practitioners (79.2%), had been to a risk management seminar (54.2%), and from average size ($2 < n < 10$) dental practices (79.2%). Respondents who indicated they use steam under pressure to sterilize dental instruments were between 30-39 years of age (39%), had practiced 25 years or more (22%), were more likely to be general practitioners (82.6%), had not attended a risk management seminar (58.9%), and were from average size ($2 < n < 10$) practices (74.8%). The respondents who stated they use chemical vapor to sterilize dental instruments were between 30-39 years of age (46.7%), had

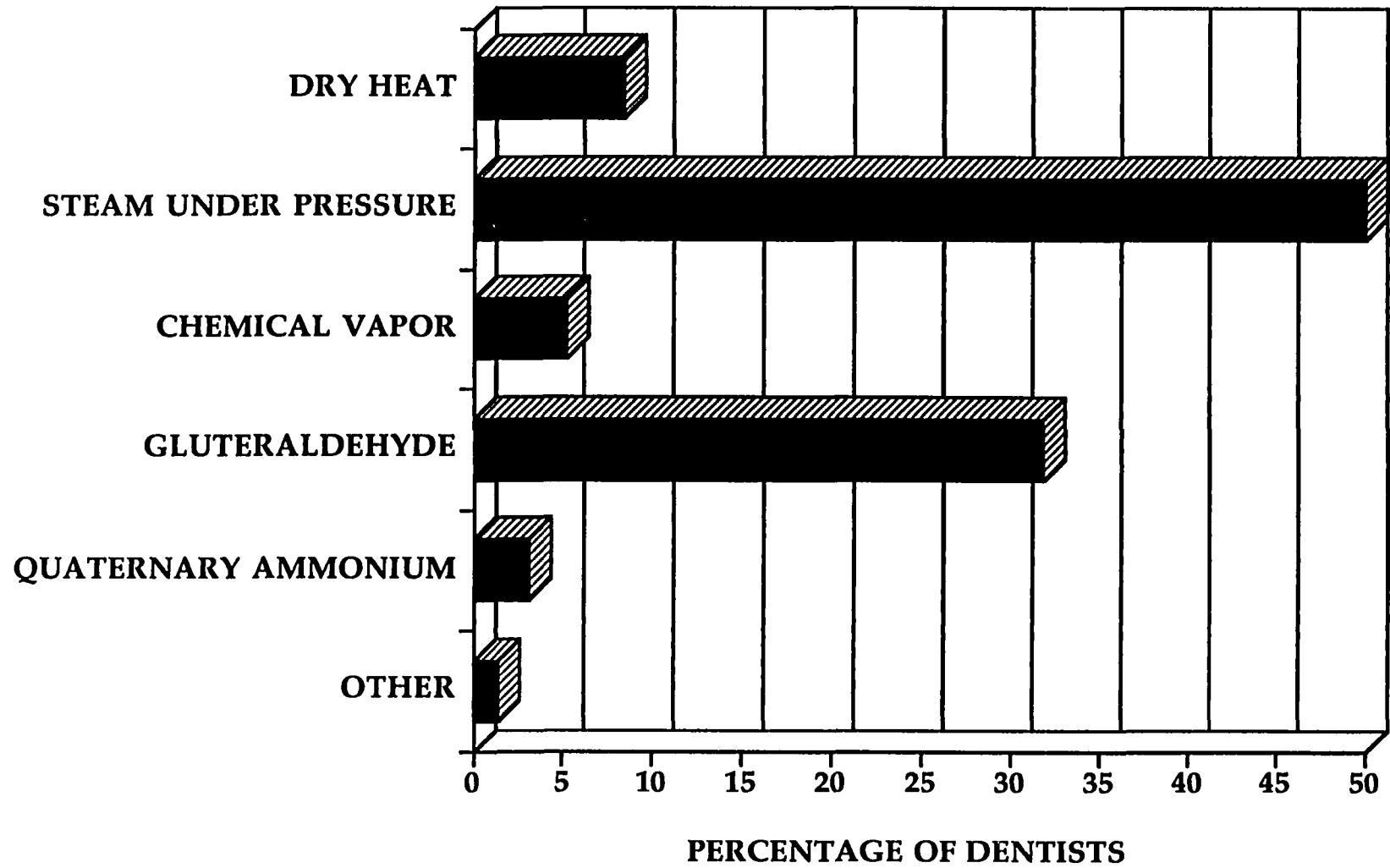


Figure 9. Sterilization techniques used by Virginia dentists.

practiced between 15-19 years (26.7%), were more likely to be general practitioners (80%) and orthodontists (13.3%), had attended a risk management seminar (53.3%), and were from average size ($2 < n < 10$) practices (80%). The respondents who indicated they use glutaraldehyde to sterilize dental instruments were between 30-39 years of age (42.2%), had practiced between 10-14 years (26.7%), were more likely to be general practitioners (75.3%), had not been to a risk management seminar (57.8%), and were from average size ($2 < n < 10$) dental practices (78%). The majority of respondents who indicated they use quaternary ammonium compounds were 50 years and older (44.4%), had practiced 25 years or more (44.4%), were more likely to be general practitioners (75%) and orthodontists (25%), had not been to a risk management seminar (55.6%), and were from average size ($2 < n < 10$) dental practices (88.9%) (see Table 7).

Item 32 asked respondents how they monitored sterilization effectiveness (see Figure 10). The majority (58.8%) indicated they use color change tape, 2.6% use dosage indicators, 14.9% use biological indicators, 20.1% stated they do not use any of the above methods while 3.6% use some other method of monitoring sterilization effectiveness. Chi-square analysis was performed using the respondents' years in practice ($p = 0.1098$, $df = 7$), size of the dental practice ($p = 0.2596$, $df = 2$), and formal

TABLE 7
STERILIZATION TECHNIQUES USED BY VIRGINIA DENTISTS ACCORDING
TO AGE, YEARS IN PRACTICE, SPECIALTY, PRACTICE SIZE, AND
FORMAL EDUCATION IN RISK MANAGEMENT PRACTICES

	Age	Yrs in Practice	Specialty (ies)	Practice Size	Risk Management Seminar
DRY HEAT	40 - 49 (37.5%)	10 - 14 YRS (41.7%)	G.P.* (79.2%)	AVERAGE (79.2%)	YES (54.2%)
STEAM UNDER PRESSURE	30 - 39 (39%)	25+ YRS (22%)	G.P.* (82.6%)	AVERAGE (74.8%)	NO (58.9%)
CHEMICAL VAPOR	30 - 39 (46.7%)	15 - 19 YRS (26.7%)	G.P.* (80%) Ortho (13.3%)	AVERAGE (80%)	YES (53.3%)
GLUTERALDEHYDE	30 - 39 (42.2%)	10 - 14 YRS (26.7%)	G.P.*% (75.3%)	AVERAGE (78%)	NO (57.8%)
QUATERNARY AMMONIUM	50+ YRS (44.4%)	25+ YRS (44.4%)	G.P.* (75%) Ortho (25%)	AVERAGE (88.9%)	NO (55.6%)
OTHER	0	0	0	0	0

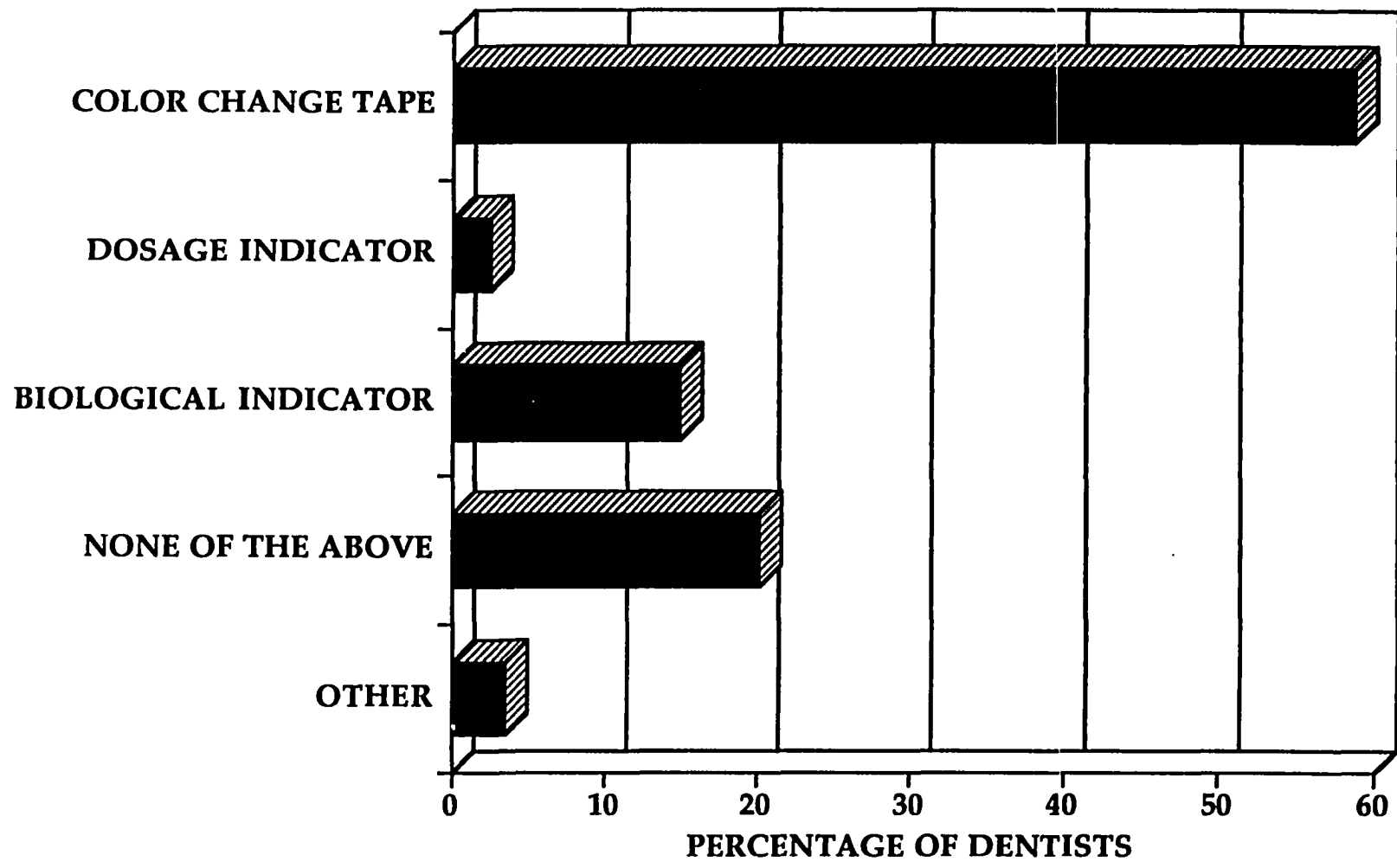


Figure 10. Sterilization monitoring techniques used by Virginia dentists.

education on the principles of risk management ($p = 0.2809$, $df = 3$), yielded no statistically significant results when cross tabulated with the item 32 selection "color change tape." However, statistically significant results were obtained using the respondents' age ($p = 0.0554$, $df = 4$) and dental specialty ($p = 0.0187$, $df = 8$), indicating that orthodontists and respondents 50 years and older were less likely to use color change tape than any other group. Analysis revealed no statistically significant results when the respondents' age ($p = 0.4459$, $df = 4$), years in practice ($p = 0.5023$, $df = 7$), dental specialty ($p = 0.3251$, $df = 8$), and size of the dental practice ($p = 0.2747$, $df = 2$) were cross tabulated with the selection "biological indicators." Statistically significant results were obtained using the respondents' formal education on the principles of risk management ($p = 0.0313$, $df = 3$); however, the data is inconclusive due to the majority of the respondents who indicated a risk management seminar was not applicable to their situation.

Item 33 indicated that for surface disinfection, 29.4% of the respondents use glutaraldehyde, 3.1% use quaternary ammonium compounds, 17.3% use hypochlorites, 26.1% use alcohol, 11.2% use iodophors, 3.9% use phenols, 11.5% use soap and water while 2.5% use another type of surface disinfectant. Chi-square analysis revealed periodontists were more likely to use iodophors ($p = 0.0539$, $df = 8$);

whereas, oral surgeons were least likely to use iodophors as surface disinfectants than any other dental specialist.

Item 34 asked respondents about disposable items discarded after one use. Fifteen point one percent (15.1%) of the respondents indicated that patient napkins were discarded after one use, 13% discarded the saliva ejector, 8.7% discarded the rubber cup, 7.5% discarded the prophylaxis brush, 11.3% discarded the headrest covers, 13.8% discarded tray covers, 12.4% discarded rubber examination gloves, 3.2% discarded face masks, 14.8% discarded needles, 0.2% discarded none of the above, while 0.1% discarded other items after one use. Chi-square analysis revealed no statistically significant results when the respondents' age ($p = 0.1902$, $df = 4$), years in practice ($p = 0.3228$, $df = 7$), size of the dental practice ($p = 0.2496$, $df = 2$), and formal education on the principles of risk management ($p = 0.7376$, $df = 3$) were cross tabulated with the selection "saliva ejector." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0000$, $df = 8$), indicating that oral surgeons were least likely to discard the saliva ejector; whereas, periodontists were most likely to discard the saliva ejector after one use. Analysis revealed no statistically significant results when the respondents' age ($p = 0.1283$, $df = 4$), years in practice ($p = 0.1622$, $df = 7$), size of the dental practice ($p = 0.2037$, $df = 2$), and

formal education on the principles of risk management ($p = 0.2841$, $df = 3$) were cross tabulated with the selection "rubber cup." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0281$, $df = 8$), indicating that oral surgeons were least likely to discard the rubber cup after one use. No relationship was established when the variables of years in practice ($p = 0.7670$, $df = 7$), dental specialty ($p = 0.1333$, $df = 8$), size of the dental practice ($p = 0.3964$, $df = 2$), and formal education on the principles of risk management ($p = 0.6891$, $df = 3$) were cross tabulated with the selection "prophy brushes." However, a relationship was obtained using the variable of age ($p = 0.0357$, $df = 4$). Respondents more likely to discard prophylactic brushes after one use were between 30-39 years of age; whereas, respondents 50 years and older were least likely to discard prophylactic brushes after one use. Analysis revealed no statistically significant results when the respondents' age ($p = 0.3833$, $df = 4$), years in practice ($p = 0.1526$, $df = 7$), dental specialty ($p = 0.7601$, $df = 8$), and size of the dental practice ($p = 0.6067$, $df = 2$) were cross tabulated with the selection "tray covers." However, significant results were obtained using the respondents' formal education on the principles of risk management ($p = 0.0099$, $df = 3$), indicating that respondents who discard the tray covers after one use had attended a risk management seminar. Chi-square analysis

revealed no statistically significant results when the respondents' age ($p = 0.4917$, $df = 4$), size of the dental practice ($p = 0.5200$, $df = 2$), and formal education on the principles of risk management ($p = 0.7200$, $df = 3$) were cross tabulated with the selection "rubber examination gloves." However, statistically significant results were revealed using the respondents' years in practice ($p = 0.0186$, $df = 7$) and dental specialty ($p = 0.0084$, $df = 8$), indicating that orthodontists and respondents who have practiced 25 years or more were less likely to discard rubber examination gloves after one use. No relationship was established when the variables of age ($p = 0.5221$, $df = 4$), years in practice ($p = 0.8383$, $df = 7$), size of the dental practice ($p = 0.9605$, $df = 2$), and formal education on the principles of risk management ($p = 0.5415$, $df = 3$) were cross tabulated with the selection "needle." However, a relationship was established using the variable of dental specialty ($p = 0.0000$, $df = 8$). Orthodontists were least likely to discard a needle after one use than any other dental specialty. Statistically significant results were obtained using the respondents' age ($p = 0.0211$, $df = 4$), indicating that respondents least likely to discard any of the disposable items were between 22-29 years of age.

Item 35 indicated that when treating high risk patients, 20.3% of respondents use disposable items; 2.1% use surgical gowns for the patient; 4.3% use surgical gowns

for the dental personnel; 5.9% drape all possible equipment; 20% use face masks; 19.6% use safety glasses; 19.3% dispose of all items that cannot be sterilized; 6.0% place gowns, gloves, and other disposable items in a separate bag marked "high risk"; 0.7% do none of the above procedures while 1.9% they do some other type of procedure when seeing high risk patients. Chi-square analysis revealed no statistically significant results when the variable of age ($p = 0.7035$, $df = 4$), years in practice ($p = 0.6045$, $df = 7$), size of the dental practice ($p = 0.1407$, $df = 2$), and formal education on the principles of risk management ($p = 0.6924$, $df = 3$) were cross tabulated with the selection "surgical gown for dental personnel." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0361$, $df = 8$), indicating that periodontists were more likely to use a surgical gown for dental personnel; whereas, general practitioners were least likely to use a surgical gown for dental personnel when treating high risk patients. No relationship was established when the variables of age ($p = 0.3456$, $df = 4$), years in practice ($p = 0.2365$, $df = 7$), and dental specialty ($p = 0.1485$, $df = 8$) were cross tabulated with the selection "drape all equipment." However, a relationship was established using the respondents' size of the dental practice ($p = 0.0416$, $df = 2$) and formal education on the principles of risk management ($p = 0.0569$, $df = 3$),

indicating that respondents more likely to drape all equipment were from large size ($n > 10$) dental practices and had attended a risk management seminar. Analysis revealed no statistically significant results when the respondents' dental specialty ($p = 0.1535$, $df = 8$), size of the dental practice ($p = 0.3262$, $df = 2$), and formal education on the principles of risk managements ($p = 0.7590$, $df = 3$) were cross tabulated with the selection "safety glasses."

However, statistically significant results were obtained using the respondents' age ($p = 0.0576$, $df = 4$), years in practice ($p = 0.0414$, $df = 7$), indicating that respondents less likely to wear safety glasses were 50 years and older, and had practiced for 25 years or more. Analysis revealed no statistically significant results when the respondents' age ($p = 0.1384$, $df = 4$), dental specialty ($p = 0.4392$, $df = 8$), size of dental practice ($p = 0.1572$, $df = 2$), and formal education on the principles of risk management ($p = 0.2356$, $df = 3$) were cross tabulated with the selection "gown and disposable items placed in separate high risk bag."

However, statistically significant results were obtained using the respondents' years in practice ($p = 0.0125$, $df = 7$), indicating that respondents more likely to place gowns and other disposable items into a separate bag marked "high risk" had practiced between 2-4 years. Analysis revealed no statistically significant results when the respondents' age ($p = 0.6685$, $df = 4$), years in practice ($p = 0.5930$, $df =$

7), size of the dental practice ($p = 6500$, $df = 2$), and formal education on the principles of risk management ($p = 0.8118$, $df = 3$) were cross tabulated with the selection "none of the above." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0000$, $df = 8$), indicating that orthodontists were least likely to use infection control procedures than any other specialist.

Item 36 revealed that to identify high risk patients on the dental record, 50.5% of the respondents use labeling with words on the front of the dental record, 31.7% use color-coded stickers, 7.0% do not identify high risk patients on the record, and 10.8% use some other form of identifying high risk patients. No statistically significant results were obtained when the respondents' age ($p = 0.8324$, $df = 4$), years in practice ($p = 4540$, $df = 7$), size of the dental practice ($p = 0.9031$, $df = 2$), and formal education on the principles of risk management ($p = 0.3169$, $df = 3$) were cross tabulated with the selection "label with words." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0446$, $df = 8$), indicating that orthodontists were least likely to label with words high risk patients than any other dental specialist.

Research Question Three

Is an informed consent to care presented to the patient

prior to treatment? Three questionnaire items (37-39) provided information relative to this question.

Overall responses ($n = 170$) to item 37 indicated that 20.6% of the respondents explain the benefits of receiving the recommended service to the patient, as well as the alternatives to the recommended service; 18.6% explain the risks of receiving the recommended service; 19.7% explain the risks of not receiving the recommended service, as well as the cost of the recommended service; 0.7% did not explain any of the aforementioned issues with the patient; and 0.3% explain other issues with the patient. Chi-square analysis revealed no statistically significant results when the respondents' years in practice ($p = 0.0693$, $df = 7$), dental specialty ($p = 0.3614$, $df = 2$), and formal education on the principles of risk management ($p = 0.7755$, $df = 3$) were cross tabulated with the selection "benefits of recommended service." However, statistically significant results were obtained using the respondents' age ($p = 0.0536$, $df = 4$), indicating that respondents least likely to explain the benefits of the recommended service were 50 years and older; whereas, respondents 30-39 years were more likely to explain the benefits of the recommended services to the patient. No relationship was established when the respondents' dental specialty ($p = 0.6521$, $df = 8$) and formal education on the principles of risk management ($p = 0.7504$, $df = 3$) were cross tabulated with the selection "risks of receiving the

recommended service." However, a relationship was established using the respondents' age ($p = 0.0033$, $df = 4$), years in practice ($p = 0.0035$, $df = 7$), and size of the dental practice ($p = 0.0003$, $df = 2$). Respondents least likely to explain the risks of the recommended services to the patient were 50 years or older, had practiced 25 years or more, and were from small size ($n < 2$) dental practices. Analysis yielded no statistically significant results when the respondents' age ($p = 0.1326$, $df = 4$), dental specialty ($p = 0.8649$, $df = 8$), and formal education on the principles of risk management ($p = 0.9279$, $df = 3$) were cross tabulated with the selection "alternatives to the recommended services." However, statistically significant results were yielded using the respondents' years in practice ($p = 0.0365$, $df = 7$) and size of the dental practice ($p = 0.0122$, $df = 2$). Respondents least likely to explain the alternatives to the recommended services to the patient had practiced 25 years or more and were from small size ($n < 2$) dental practices. No relationship was established when the variables of dental specialty ($p = 0.8799$, $df = 8$) and formal education on the principles of risk management ($p = 0.1839$, $df = 3$) were cross tabulated with the selection "risks of not receiving the recommended services." However, a relationship was established using the variables of age ($p = 0.0035$, $df = 4$), years in practice ($p = 0.0012$, $df = 7$), and size of the dental practice ($p = 0.0030$, $df = 2$),

indicating that respondents least likely to explain the risks of not receiving the recommended services to the patient were 50 years or older, had practiced 25 years or longer, and were from small size ($n < 2$) dental practices. Analysis revealed no statistically significant results when the respondents' age ($p = 0.6777$, $df = 4$), years in practice ($p = 0.3296$, $df = 7$), and formal education on the principles of risk management ($p = 0.9267$, $df = 4$) were cross tabulated with the selection "cost of recommended service." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0513$, $df = 8$) and size of the dental practice ($p = 0.0000$, $df = 2$), indicating that public health dentists and respondents from small size ($n < 2$) dental practices were least likely to explain the cost of the recommended services to the patient.

Item 38 revealed that the majority of the respondents (51.1%) have the dentist explain the issues of the recommended services to the patients, 14.6% have the dental assistant explain the issues, 17% have the dental hygienist explain the issues, 9.9% have the dental receptionist explain the services while 7.4% have the office manager explain the recommended services to the patient. Chi-square analysis revealed no statistically significant results when the respondents' age ($p = 0.5377$, $df = 4$), years in practice ($p = 0.6412$, $df = 7$), dental specialty ($p = 0.6323$, $df = 8$), and size of the dental practice ($p = 0.1377$, $df = 2$) were

cross tabulated with the selection "dentist." However, statistically significant results were obtained using the respondents' formal education on the principles of risk management ($p = 0.0175$, $df = 3$). The respondents who indicated that the dentist does not explain the recommended services also indicated a risk management seminar was not applicable. Analysis revealed no statistically significant results using the respondents' age ($p = 0.7147$, $df = 4$), years in practice ($p = 0.2483$, $df = 7$), dental specialty ($p = 0.1333$, $df = 8$), and formal education on the principles of risk management ($p = 0.8916$, $df = 3$) when cross tabulated with the selection "dental hygienist." However, statistically significant results were obtained using the respondents' size of the dental practice ($p = 0.0144$, $df = 2$), indicating that the respondents who have the dental hygienist explain the recommended services to the patient were from small ($n < 2$) practices. No relationship was established when the respondents age ($p = 0.8347$, $df = 4$), years in practice ($p = 0.0809$, $df = 7$), size of the dental practice ($p = 0.1645$, $df = 2$), and formal education on the principles of risk management ($p = 0.3895$, $df = 3$) were cross tabulated with the item 38 selection "dental receptionist." However, a relationship was established using the respondents' dental specialty ($p = 0.0242$, $df = 8$), indicating that oral surgeons are more likely to have the dental receptionist explain the recommended procedures

to the patient than any other dental specialist.

Item 39 indicated that from the selected procedures, 42.9% do not use a written consent form, 21.7% use a general consent form agreeing to all services, 1.5% use a consent form for restorations, 3.5% use a consent form for emergency procedures, 13.1% use a consent form for oral surgery procedures, 4.5% require a consent for periodontal surgeries, 4.0% use a consent form for prosthetic appliances, and 8.6% use a consent form for some other procedures (See Figure 11). Chi-square analysis revealed no statistically significant results when the respondents' age ($p = 0.3420$, $df = 4$), years in practice ($p = 0.9661$, $df = 7$), size of the dental practice ($p = 0.7935$, $df = 2$), and formal education on the principles of risk management ($p = 0.9234$, $df = 3$) were cross tabulated with the selection "general consent." However, a relationship was established using the respondents' dental specialty ($p = 0.0297$, $df = 8$). Public health dentists were more likely to use a general consent form agreeing to all services than any other dental specialty. No relationships can be established when the respondents' age ($p = 0.3201$, $df = 4$), size of dental practice ($p = 0.4767$, $df = 2$), and formal education on the principles of risk management ($p = 0.4767$, $df = 2$) were cross tabulated with the selection "restoratives." However, a relationship was established using the respondents' years in practice ($p = 0.0001$, $df = 7$) and dental specialty ($p =$

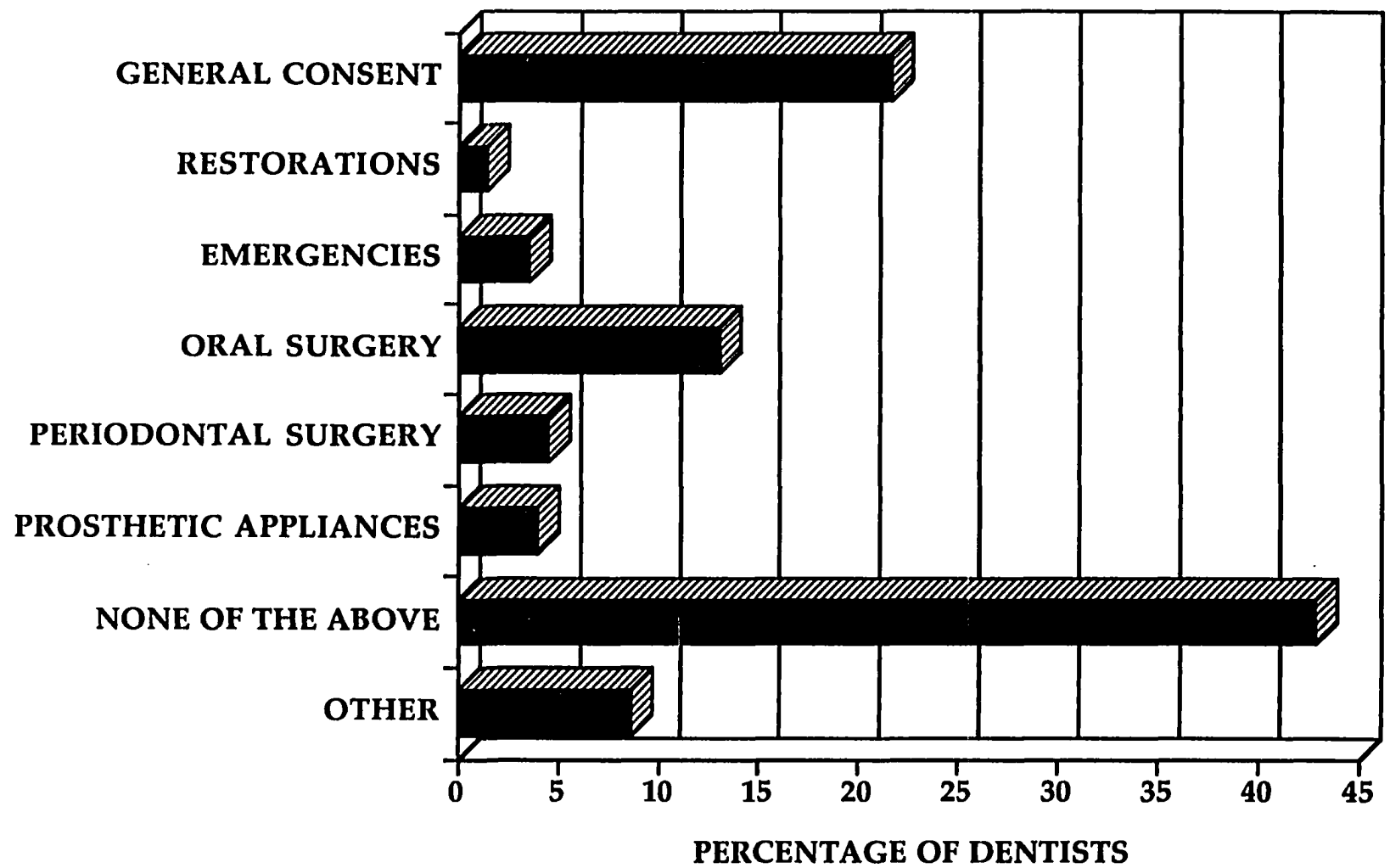


Figure 11. Conditions under which Virginia dentists employ written consent forms.

0.0284, $df = 8$), indicating that public health dentists and respondents who have practiced between 5-9 years were more likely to use a consent form for restorative procedures. Analysis revealed no statistically significant results when the respondents' years in practice ($p = 0.4825$, $df = 7$), size of the dental practice ($p = 0.3477$, $df = 2$), and formal education on the principles of risk management ($p = 0.7617$, $df = 3$) were cross tabulated with the selection "emergencies." However, significant results were obtained using the respondents' age ($p = 0.0105$, $df = 4$) and dental specialty ($p = 0.0001$, $df = 8$), indicating that public health dentists and respondents between 22-29 years of age were more likely to use a consent form for emergency procedures. No relationship was established when the respondents' age ($p = 0.1912$, $df = 4$), years in practice ($p = 0.2520$, $df = 7$), size of the dental practice ($p = 0.1771$, $df = 2$), and formal education on the principles of risk management ($p = 0.1066$, $df = 3$) were cross tabulated with the selection "oral surgery." A relationship was established using the respondents' dental specialty ($p = 0.0076$, $df = 8$), indicating that oral surgeons utilized written consent forms for oral surgery procedures more than any other dental specialty. No relationship was established when the respondents' age ($p = 0.8514$, $df = 4$), years in practice ($p = 0.8335$, $df = 7$), size of the dental practice ($p = 0.3413$, $df = 2$), and formal education on the principles

of risk management ($p = 0.3527$, $df = 3$) were cross tabulated with the selection "periodontal surgery." A relationship was established, however, using the respondents' dental specialty ($p = 0.0029$, $df = 8$), indicating that periodontists were more likely to use a written consent for periodontal procedures than any other dental specialist. A relationship was established using the respondents' dental specialty ($p = 0.0006$, $df = 8$), indicating that orthodontists were least likely to use any of the aforementioned consent forms and more likely to use some other type of consent form. The data for the selection "prosthetic appliances" revealed no statistically significant results when cross tabulations were performed.

Research Question Four

Are periodontally involved patients identified and classified? One questionnaire item (40) provided information relative to this question.

Item 40 queried respondents about periodontal classification procedures completed on patients. Thirty-one point four percent of respondents indicated they chart carious lesions, 19.4% chart existing restorations, 10.5% chart all periodontal pocket readings, 18.2% chart only periodontal pocket readings above 4mm while 20.5% chart the patient's periodontal and gingival conditions. Chi-square analysis revealed no statistically significant results when the respondents' age ($p = 0.2155$, $df = 4$), years in practice

($p = 0.4364$, $df = 7$), size of dental practice ($p = 0.4299$, $df = 2$), and formal education on the principles of risk management ($p = 0.0677$, $df = 3$) were cross tabulated with the selection "chart existing restorations." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0077$, $df = 8$), indicating that orthodontists were least likely to chart existing restorations or carious lesions ($p = 0.0000$, $df = 8$) than any other dental specialty. Analysis revealed no statistically significant results when the respondents' years in practice ($p = 0.4085$, $df = 7$), size of the dental practice ($p = 0.2645$, $df = 2$), and formal education on the principles of risk management ($p = 0.1357$, $df = 3$) were cross tabulated with the selection "chart all periodontal pockets." However, statistically significant results were yielded using the respondents' age ($p = 0.0048$, $df = 4$) and dental specialty ($p = 0.0001$, $df = 8$), indicating that periodontists were more likely to chart all periodontal pockets than any other dental specialty. Additionally, respondents between 30-39 were least likely to chart all periodontal pocket readings. Analysis revealed no statistically significant results when the respondents' years in practice ($p = 0.3039$, $df = 7$), size of the dental practice ($p = 0.7794$, $df = 2$), and formal education on the principles of risk management ($p = 0.3598$, $df = 3$) were cross tabulated with the selection "chart periodontal

pockets above 4mm." However, significant results were obtained using the respondents' age ($p = 0.0380$, $df = 4$) and dental specialty ($p = 0.0084$, $df = 8$), indicating that respondents least likely to chart periodontal pockets above 4mm were 50 years and older, while orthodontists were least likely to record periodontal pockets above 4mm on their patients. Analysis, using the respondents' age ($p = 0.6562$, $df = 4$), years in practice ($p = 0.3285$, $df = 7$), and size of the dental practice ($p = 0.0606$, $df = 2$) revealed no statistically significant results when cross tabulations were performed using the selection "chart periodontal and gingival assessment." However, statistically significant results were revealed using the respondents' dental specialty ($p = 0.0007$, $df = 8$) and formal education on the principles of risk management ($p = 0.0148$, $df = 3$), indicating that oral surgeons were least likely to record the patients' periodontal and gingival condition. Additionally, respondents who had attended a risk management seminar were more likely to record the patients' periodontal and gingival condition.

Research Question Five

Are emergency protocols established to reduce the risk of patient injury or fatality? Three questionnaire items (41-43) provided information relative to this question.

Overall responses ($n = 170$) to item 41 indicated that the majority of respondents (51.3%) have medical emergency

kits that include bandaids, gauze, alcohol, oxygen tanks, and an ambu bag; 42.2% have drugs and/or prefilled syringes; and 6.5% have none of the above items. Chi-square analysis revealed no statistically significant results when the respondents' age ($p = 0.0888$, $df = 4$), years in practice ($p = 0.3284$, $df = 7$), size of the dental practice ($p = 0.4486$, $df = 2$), and formal education on the principles of risk management ($p = 0.5060$, $df = 3$) were cross tabulated with the selection "bandaids, gauze, etc." However, highly significant results were obtained using the respondents' dental specialty ($p = 0.0002$, $df = 8$), indicating that orthodontists were least likely to have bandaids, gauze, alcohol, oxygen tanks, and an ambu bag as part of their medical emergency kit, and least likely to have a medical emergency kit (see Figure 12). No statistically significant results were obtained using the remaining selections of item 41.

Item 42 indicated that the majority of dental offices have one dentist who is CPR certified (64.1%); most offices do not have dental assistants (52.9%), dental hygienists (70%), or have dental receptionists who are CPR certified (see Figure 13). Chi-square analysis and cross tabulations were not performed on item 42.

Item 43 indicated that most of the respondents (24.1%) include calling 911 as a part of their medical emergency procedures, 14.3% have a designated person to retrieve the

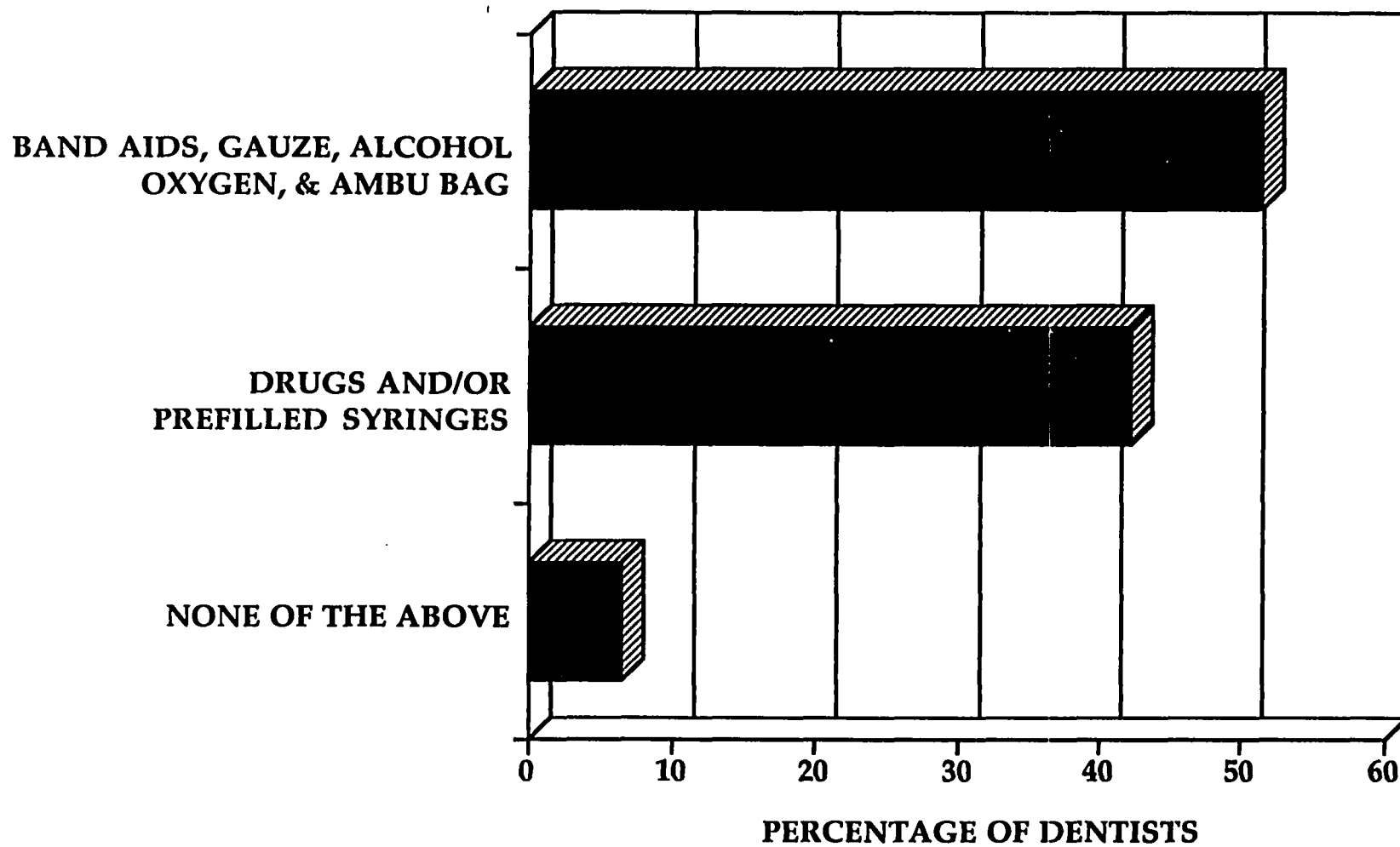


Figure 12. Contents of emergency kits maintained by Virginia dentists.

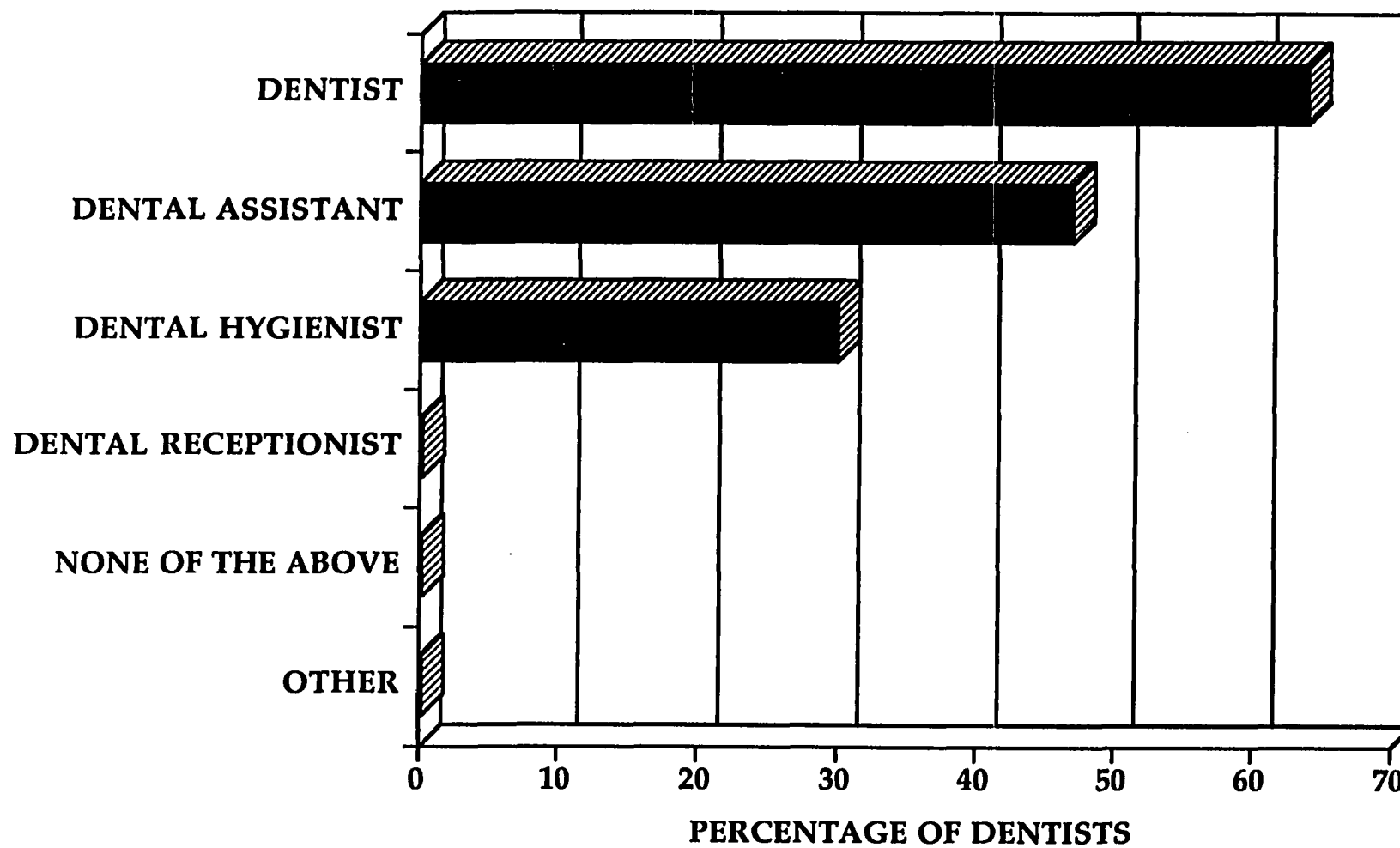


Figure 13. Individuals employed in Virginia dental practices who are currently certified in cardiopulmonary resuscitation.

medical emergency kit, 15% have a designated person to retrieve the oxygen tank, 12.6% have a designated person who remains with the patient to record blood pressure, 14% have a designated person to perform CPR, 7.5% have periodic rehearsals of their medical emergency procedure, 11.0% do none of the above procedures, and 1.6% have some other procedures they follow. Chi-square analysis revealed no statistically significant results when the respondents' age ($p = 0.9590$, $df = 4$), years in practice ($p = 0.8516$, $df = 7$), and size of the dental practice ($p = 0.7264$, $df = 2$) were cross tabulated with the selection "call 911." However, statistically significant results were yielded using the respondents' dental specialty ($p = 0.0457$, $df = 8$) and formal education on the principles of risk management ($p = 0.0162$, $df = 3$), indicating that periodontists were more likely to have a designated person call 911 than any other dental specialty. Conversely, the respondents least likely to have a designated person call 911 had not attended a risk management seminar. Analysis revealed no significant results when the respondents' age ($p = 0.2848$, $df = 4$), years in practice ($p = 0.4836$, $df = 7$), and size of the dental practice ($p = 0.7217$, $df = 2$) were cross tabulated with the selection "medical emergency kit." However, highly significant results were obtained using the respondents' dental specialty ($p = 0.0000$, $df = 8$) and formal education on the principles of risk management ($p = 0.0039$, $df = 3$),

indicating that periodontists and respondents who had attended a risk management seminar were more likely to have a designated person retrieve the medical emergency kit as part of the medical emergency procedure. No relationship was established when the respondents' age ($p = 0.7342$, $df = 4$), years in practice ($p = 0.6648$, $df = 7$), size of dental practice ($p = 0.5478$, $df = 2$), and formal education on the principles of risk management ($p = 0.2619$, $df = 3$) were cross tabulated with the selection "retrieves oxygen tank." However, a relationship was established using the respondents' dental specialty ($p = 0.0004$, $df = 8$), indicating that oral surgeons were more likely to have a designated person retrieve the oxygen tank than any other dental specialty. Analysis revealed no statistically significant results when the variables of age ($p = 0.1057$, $df = 4$), years in practice ($p = 0.8383$, $df = 7$), and size of dental practice ($p = 0.4046$, $df = 2$) were cross tabulated with the selection "remains with patient and takes blood pressure;" however, significant results were obtained using the variables of dental specialty ($p = 0.0077$, $df = 8$) and formal education on the principles of risk management ($p = 0.0425$, $df = 3$), indicating that oral surgeons were most likely to have a designated person remain with the patient and take a blood pressure measurement; whereas, orthodontists were least likely to have a designated person remain with the patient. Additionally, the respondents most

likely to have a designated person remain with the patient had attended a risk management seminar. No relationship was determined using the variables of age ($p = 0.6088$, $df = 4$), years in practice ($p = 0.4886$, $df = 7$), and size of the dental practice ($p = 0.7828$, $df = 2$) when cross tabulated with the selection "designated person performs CPR." A relationship was established using the variables of dental specialty ($p = 0.0035$, $df = 8$) and formal education on the principles of risk management ($p = 0.0111$, $df = 3$), indicating that periodontists were more likely to have a designated person perform CPR than any other dental specialty. Also, respondents who had attended a risk management seminar were more likely to have a designated person perform CPR. No statistically significant results were obtained when the respondents' age ($p = 0.5259$, $df = 4$); years in practice ($p = 0.7084$, $df = 7$) and size of the dental practice ($p = 0.0955$, $df = 2$) were cross tabulated with the item 43 selection "periodic rehearsal." Statistically significant results were obtained using the respondents' dental specialty ($p = 0.0033$, $df = 8$) and formal education on the principles of risk management ($p = 0.0409$, $df = 3$), indicating that oral surgeons and respondents who had attended a risk management seminar were more likely to periodically rehearse their medical emergency procedure. Additionally, the data revealed that the majority of the respondents who indicated they do none of

the above procedures had not attended a risk management seminar ($p = 0.0333$, $df = 3$).

Research Question Six

Are office policies and procedures established and employed? Eight questionnaire items (44-51) provided information relative to this question.

Item 44 indicated that the majority of respondents (52.4%) have an office policy manual, while 47.6% do not. Five separate cross tabulations, using chi-square analysis, were performed (see Table 8). The first analysis, using the respondents' age, revealed statistically significant results ($p = 0.0000$, $df = 8$), indicating that respondents between 40-49 years of age were more likely to have an office policy manual than any other year group. The second analysis, using the respondents' years in practice, revealed statistically significant results ($p = 0.0000$, $df = 14$), indicating that respondents who had practiced between 10-14 years were more likely to have an office policy manual than any other year group. The third analysis, using the respondents' dental specialty, yielded highly significant results ($p = 0.0001$, $df = 16$), indicating that orthodontists and periodontists were most likely to have an office policy manual than any other dental specialty. The fourth analysis, using the respondents' size of the dental practice, revealed significant results ($p = 0.0176$, $df = 4$), indicating that small size ($n < 2$) dental practices were

TABLE 8

**OFFICE POLICY MANUALS MAINTAINED BY VIRGINIA DENTISTS
ACCORDING TO AGE, YEARS IN PRACTICE, SPECIALTY, PRACTICE
SIZE, AND FORMAL EDUCATION IN RISK MANAGEMENT PRACTICE**

	p - Value	df	Practitioner Group
AGE	0.0000	8	40 - 49 YRS OLD
YEARS IN PRACTICE	0.0000	14	10 - 14 YRS
SPECIALITY	0.0001	16	ORTHODONTISTS & PERIODONTISTS
PRACTICE SIZE	0.0176	4	SMALL PRACTICES LEAST LIKELY
RISK MANAGEMENT SEMINAR	0.0000	6	YES

least likely to have an office policy manual; whereas, large size dental practices were most likely to have an office policy manual. The fifth analysis, using the respondents' formal education on the principles of risk management, revealed statistically significant results ($p = 0.0000$, $df = 6$), indicating that respondents who had attended a risk management seminar were more likely to have an office policy manual.

Item 45 indicated that 16.5% of the respondents include greeting of new patients and scheduling appointments in their office manual, 13.9% include a schedule of services and time allotments, 12.9% include a fee schedule for rendered services, 13.7% review handling of paperwork, 9.1% include the emergency protocols, 10.4% include the infection control procedures, 15.2% include hiring and dismissal procedures, 7.1% do not have an office manual, and 7.3% include other topics in their office policy manual. Chi-square analysis revealed no statistically significant results when the respondents' years in practice ($p = 0.7626$, $df = 14$) and formal education on the principles of risk management ($p = 0.2228$, $df = 6$) were cross tabulated with the selection "greeting new patients." However, statistically significant results were obtained using the respondents' age ($p = 0.0000$, $df = 8$), dental specialty ($p = 0.0000$, $df = 16$), and size of the dental practice ($p = 0.0449$, $df = 4$), indicating that orthodontists and

respondents from small size ($n < 2$) dental practices were more likely to include greeting procedures in their office manuals. The data obtained on the respondents' age was inconclusive due to a 1% margin of error. Analysis revealed no statistically significant results when the respondents' age ($p = 0.6926$, $df = 4$), years in practice ($p = 0.4171$, $df = 7$), size of the dental practice ($p = 0.2052$, $df = 2$), and formal education on the principles of risk management ($p = 0.3226$, $df = 3$) were cross tabulated with the selection "infection control procedures." However, statistically significant results were obtained using the respondents' dental specialty ($p = 0.0198$, $df = 8$), indicating that periodontists were more likely to include infection control procedures in their dental office manual than any other dental specialist. No relationship was established when the respondents' age ($p = 0.4370$, $df = 4$), years in practice ($p = 0.3312$, $df = 7$), size of the dental practice ($p = 0.4771$, $df = 2$), and formal education on the principles of risk management ($p = 0.1893$, $df = 3$) were cross tabulated with the selection "hiring and dismissal procedures." However, a significant relationship was established using the respondents' dental specialty ($p = 0.0022$, $df = 8$), indicating that periodontists and orthodontists were more likely to include hiring and dismissal procedures in their dental office policy manuals. The remaining selections revealed no statistically significant results.

Item 46 indicated that the majority of respondents (57.1%) do provide a formal orientation for new office personnel, while 36.5% do not. Five separate cross tabulations, using chi-square analysis, were performed. Analysis, using the respondents' age revealed statistically significant results ($p = 0.0000$, $df = 12$), indicating that respondents who were 50 years and older stated formal orientations were not applicable to their practice. Analysis using the respondents' years in practice revealed significant results ($p = 0.0021$, $df = 21$), indicating that respondents who had practiced 25 years or more believed a formal orientation was not applicable to their practice. Significant results were obtained using the respondents' dental specialty ($p = 0.0164$, $df = 24$); however, the data was inconclusive due to the number of pediatric dentists that did not respond to item 46. The fourth analysis, using the respondents' size of the dental practice, revealed no statistically significant results, ($p = 0.1785$, $df = 6$). The final analysis, using the respondents' formal education on the principles of risk management, yielded statistically significant results ($p = 0.0000$, $df = 9$), indicating that respondents least likely to provide a formal day of orientation had not attended a risk management seminar.

Item 47 indicated that the majority of the respondents (78%) do not use employment or termination contracts, whereas, 13.8% use only employment contracts, and 5.7% use

only termination contracts. Chi-square analysis revealed no statistically significant results when the respondents' years in practice ($p = 0.8373$, $df = 14$) and formal education on the principles of risk management ($p = 0.8850$, $df = 6$) were cross tabulated with the selection "employment contracts." However, statistically significant results were obtained using the respondents' age ($p = 0.0000$, $df = 8$), dental specialty ($p = 0.0000$, $df = 16$), and size of the dental practice ($p = 0.0078$, $df = 4$), indicating that respondents more likely to use employment contracts were between 40-49 years of age and were public health dentists. Respondents from large size practices ($n > 10$) were more likely to find employment contracts not applicable to their dental practices. Analysis revealed no statistically significant results when the respondents' age ($p = 0.0993$, $df = 4$), years in practice ($p = 0.7483$, $df = 7$), dental specialty ($p = 0.4524$, $df = 8$), and formal education on the principles of risk management ($p = 0.3968$, $df = 3$) were cross tabulated with the selection "none of the above." However, statistically significant results were obtained using the respondents' size of the dental practice ($p = 0.0054$, $df = 2$), indicating that respondents from large size ($n > 10$) dental practices were more likely to use some kind of contract other than what was listed.

Item 48 indicated that the majority of the respondents (78.2%) found the need to have their attorneys validate

their employment and termination contracts "not applicable," 4.7% did have their attorneys validate their contracts, and 15.9% did not. Five cross tabulations, using chi-square analysis, were performed. The first analysis, using the respondents' age revealed significant results ($p = 0.0000$, $df = 12$), indicating that respondents between 40-49 years of age were least likely to have their attorneys validate their contracts. The second analysis, using the respondents' years in practice, revealed significant results ($p = 0.0001$, $df = 21$), indicating that respondents who had practiced between 15-19 years were least likely to have their attorneys validate their contracts. The third analysis, using the respondents' dental specialty, revealed significant results ($p = 0.0011$, $df = 24$), indicating that public health dentists were more likely to have their attorneys validate their contracts, while prosthodontists were least likely to have their attorneys validate their employment and termination contracts. The fourth analysis, using the respondents' size of the dental practice, revealed no statistically significant results ($p = 0.1210$, $df = 6$), indicating no relationship with item 48. The final analysis, using the respondents' formal education on the principles of risk management, revealed significant results ($p = 0.0000$, $df = 9$), indicating that respondents who did not have their attorneys validate their contracts also found risk management seminars not applicable to their situation.

Item 49 indicated that the majority of the respondents (57.1%) have an operable handicap ramp to their building or office, 38.2% did not, and 4.1% indicated that a handicap ramp was not applicable to their situation. Five cross tabulations were performed using chi-square analysis. The first analysis, using the respondents' age revealed significant results ($p = 0.0000$, $df = 12$), indicating that respondents between 40-49 years of age were more likely to have operable handicap ramps to the building or office. Analysis revealed statistically significant results when cross tabulations were performed using the variables of dental specialty ($p = 0.0021$, $df = 24$), years in practice ($p = 0.0000$, $df = 21$), and the size of the dental practice ($p = 0.0004$, $df = 6$). Pediatric dentists, respondents who had practiced one year or less, and large size ($n > 10$) dental practices believed that operable handicap ramps were not applicable to their situations. The final analysis, using the respondents' formal education on the principles of risk management, revealed statistically significant results ($p = 0.0000$, $df = 9$), indicating that respondents who do have operable handicap ramps had attended a risk management seminar.

Item 50 indicated that the majority of the respondents (67.1%) found inspecting the toys in the patient reception room for sharp or broken edged was not applicable to their practice, 22.4% did inspect the toys, and 10% did not. Chi-

square analysis revealed data that were irrelevant; therefore, no relationship was established.

Item 51 indicated that 19.4% of the respondents inspect the parking lots and sidewalks for ice; 18.4% inspect for broken glass; 17% inspect for stray nails; 17.7% inspect for sharp objects; 19.2% inspect for snow; 5.9% inspect for none of the above; and 2.4% inspect for other objects. Chi-square analysis revealed data that were inconclusive due to the total number of not applicable and non-responses.

Discussion

Results are discussed in order of their relation to the original research questions posed in this study. Items 1, 12, and 16 were preludes to the questionnaire items following each and offer no trends as far as a risk management principle; therefore, those items will not be discussed.

Research Question One

Are documentation techniques used when reviewing and recording health/dental histories? Data suggested that the majority of dentists were original owners of their practice; therefore, they had no need to obtain a written consent from their patients granting access to their dental records. However, 19% of the non-original practice owners indicated they did not obtain a written consent, which diverges from recommended risk management practice. Practitioners who

purchased a dental practice from another should receive a written consent from each patient granting access to his/her dental record. Without each patient's consent, confidentiality may be breached and a civil suit may follow.⁴⁵

The use of ball point pens on the health/dental history and services rendered form complies with the documentation recommendations by Wade.⁶³ Ball point pen ink does not smear and cannot be erased, making it a permanent recording. The 42.7% of the respondents who are using another type of recording device are putting themselves at risk due to the possibility of smearing and erasures. If an entry cannot be read, it can be argued that what was documented did not occur.⁶³

Data revealed that 25.4% of the respondents are following the recommended risk management practice by having the patient and dentist complete the health/dental history. A self-administered health history form leaves too much to chance in discovering medical problems.⁴⁵ For example, a patient may not understand or consider the question unimportant, resulting in negative responses.⁴⁵ Additionally, if dental personnel complete the health/dental history form for the patient, then the patient should sign and date the form to indicate that the documentation is accurate.⁶³

Responses concerning when the health/dental history is

reviewed suggested that Virginia dental practitioners are following the recommendation of reviewing the health/dental history prior to patient treatment.⁴⁵ Reviewing the health/dental history at any other time puts the practitioner and patient at great risk. As Pollack⁴⁵ points out, "when a history of rheumatic fever is not discovered, it does not matter who is at fault. The consequences to the patient and dentist may be disastrous." For example, a situation occurred in which a dentist administered a local anesthetic with epinephrine to a hypertensive patient which caused a cerebral hemorrhage and, ultimately, the patient's death.⁴⁵ This incident might have been avoided had the dental practitioner obtained and reviewed the patient's health history prior to treatment.

Even though the majority (60.5%) of dental practitioners subscribe to the recommended risk management technique of reviewing both negative and positive responses on the medical history, the percentage (28.5%) reviewing only positive responses is high. It is recommended that dental practitioners review both positive and negative responses to correct any misinterpreted or misunderstood questions. For example, patients may know that they had "yellow jaundice" when, in fact, they had hepatitis.

Responses to item 8, addressing the signing of the health/dental history, revealed that the majority (70.4%) of practitioners are not complying with the principles of risk

management by having the patient sign the history form after it has been reviewed. The standard of practice is to have the dentist sign the health history form indicating that the dentist has read and reviewed the information with the patient for accuracy.^{45,63} Practitioners who have dental personnel sign the health history form after it has been reviewed are ultimately responsible for the actions and decisions of their employees. The possibility exists that the respondents misread item 8 to ask "Who signs the medical/dental history form when it is completed?" Many standard health/dental history forms require the patient to sign and date it when it is completed. This might explain why so many responded to the selection "patient." Also, perhaps the respondents are unsure of what reviewing the health/dental history really involves.

Dental practitioners who are updating their patient's health/dental history at every appointment or every recall appointment, are following the recommended procedure of updating the health history at short and regular intervals.⁴⁵ Practitioners who update the health history annually, every three years, or never, (43.7% of Virginia dentists) are putting themselves at great risk, because individual wellness varies in degree and scope. Possibly many practitioners feel that having the patient sign an updated health history at short intervals would generate too much paper relative to the size of a typical patient record.

An alternative for the dental practitioner is to verbally review the patient's current health status and then document the procedure and findings in the patient's record.⁴⁵

Data support that dental practitioners are following the recommended procedure of documenting each entry on the Services Rendered Record in chronological order, on consecutive lines.⁶³ Recording services rendered in chronological order assures easy referral to the performed services; assures clean, neat and organized documentation; and prevents additions or deletions, relinquishing the practitioner from any doubts or suspicion on the reliability of the record. Even though the majority (94.1%) of practitioners responded positively to item 10, the possibility exists that many did not understand its meaning or were unaware of its relevance.

The majority (69%) of dental practitioners are documenting the performed services after treatment, which complies with good risk management practices; however, the percentage who are documenting before and during treatment is high (30.6%). Wade⁶³ states that no entry should ever be made in advance of the performed procedure. A primary reason is conditions arise which could warrant a change in the original treatment plan. For example, a dental practitioner could diagnose that a two surface restoration (e.g. mesial occlusal) is indicated; however, during the cavity preparation the dentist recognizes the need for a three

surface restorations.

Dental practitioners (45.3%) who read and co-sign the documented services rendered by the hygienist or dental assistant are complying with the recommended risk management techniques. However, the percentage of not applicable responses, and practitioners who indicated they did not read and cosign the documented service was very high (53.6%). Possibly the practitioner documents all recordings (55.2%), as indicated by item 12, or they did not understand the meaning of item 13. Additionally, the possibility exists that practitioners are not functioning under the legal concept of direct supervision; consequently, they are unaware of the relevancy of item 13.

Wade⁶³ recommends that dental practitioners read and cosign all documented recordings done by dental personnel. This practice attests to the authenticity of what was recorded and performed.

An overwhelming majority (95.9%) of respondents indicated that the entries in their dental records are legible. This practice is supported by current literature, which states that printing is preferred with letters of uniform size and words evenly spaced.^{16,45,63} Furthermore, if an entry cannot be read, it can be argued that what was documented did not occur.⁶³ Possibly, the percentage of positive responses was so high because the respondents' handwriting is legible to them.

Responses that addressed which patient records are retained in the office revealed that many dental practitioners are not retaining both active and inactive patient records. The current risk management recommendation is to retain both active and inactive patient records for as long as possible. Without dental records, it is virtually impossible to defend a civil suit.^{44,45,46} The question referred to records that are kept in the office, and it is possible that some dental practitioners do not keep their inactive files in their office. This finding could explain why some practitioners indicated that they do not retain all inactive records in their office. However, it is important to note that practitioners who had attended a risk management seminar did retain all inactive patient records.

Responses to item 17 revealed that the majority of dental practitioners do not require a recent blood test to confirm negative results for AIDS or hepatitis B from hemophiliacs, blood transfused patients, renal dialysis patients, and leukemia patients. Requiring a blood test could be considered discriminatory and possibly unconstitutional. Due to the nature of their disease or treatment, these patients are more susceptible to nosocomial acquisition of AIDS or hepatitis B.^{4,6,13} However, of the practitioners that do require a blood test, pediatric dentists and dentists who have practiced a year or less require blood tests more frequently than any other dental

specialty or year group. It is possible that pediatric dentists come in contact with more children that present one or more of these conditions than practitioners who mainly see adult patients. Dental practitioners who have practiced a year or less might have been taught the risk now obsolete standard of recommending current blood tests in dental school.

Risk management standards recommend that patients with organic heart murmurs, full joint(s) replacements, prosthetic cardiac valves, rheumatic dysfunctions, mitral valve prolapse, and lupus erythematosus receive prophylactic antibiotic coverage to prevent infective endocarditis that might result from transient bacteremias precipitated by dental treatment. Premedication of patients with functional murmurs is not only futile, but also a detriment to the patient's autoimmune system.⁶¹ Data revealed that the majority of dental practitioners are premedicating patients with prosthetic cardiac valves, mitral valve prolapse, rheumatic dysfunctions and organic heart murmurs. However, the number of practitioners who premedicate patients with full joint(s) replacements or lupus erythematosus is very low (17.6%). Additionally, the number of practitioners (10.8%) who are premedicating patients with functional heart murmurs is high. It is important to note that practitioners who do not premedicate patients with prosthetic cardiac valves, rheumatic dysfunctions, and mitral valve prolapse were 50

years and older, and/or had not attended a risk management seminar, and/or were from small size dental practices. An explanation for practitioners 50 years and older who do not premedicate prosthetic cardiac valve patients might be that they are unfamiliar with the current literature and practice recommendations on this topic. Risk management seminars and a review of the current literature may benefit practitioners who do not premedicate patients with rheumatic dysfunctions. The explanation is unclear as to why practitioners who do not premedicate patients with prosthetic cardiac valves or mitral valve prolapse are from small dental practices. Possibly large practices lend themselves to quality assurance because of built in peer review systems.

The majority of the practitioners indicated that they only take blood pressure measurements when patients present a history of hypertension. This policy does not support acceptable risk management practice since the current standard is to take blood pressure measurements at regular intervals, (e.g. every appointment, every recall appointment, once a year). Data revealed that the number of practitioners who record a blood pressure reading at regular intervals is very low (17.7%) The data further revealed that practitioners who have practiced between 2-4 years are following the recommended procedure of taking blood pressure measurements at regular intervals (recall appointment). Since these practitioners are recent graduates, it is

possible they acquired this routine while in dental school. Oral surgeons displayed the best risk management strategy by taking blood pressure readings at every appointment. Periodontists are practicing good risk management techniques by taking blood pressure readings once a year and/or during certain procedures as a monitoring device. However, orthodontists are not taking blood pressure readings. Possibly orthodontists do not consider recording blood pressure measurements because they perform non-invasive procedures primarily on children. Additionally, orthodontists may assume that blood pressure readings are being monitored by the patient's primary care dentist. However, with the ever expanding population of adult orthodontic patients, this may be a good risk management practice.

The majority of practitioners are subscribing to the current risk management practices by having a licensed professional, either the dentist or dental hygienist, perform the intra-oral and extra-oral examination. However, a small percentage (3.2%) indicated that their dental assistant performs the intra- and extra-oral examination, which is illegal in Virginia. Additionally, the data suggest that dental practitioners are underutilizing their dental hygienists (29.4%) by not having them perform the intra- and extra-oral examinations. In Virginia, this task can be confidently and legally delegated to the hygienist.

The majority (61.5%) of dental practitioners are following Wade's ⁶³ recommendation of drawing a straight line through an error to correct an entry on the dental record. However, the percentage of practitioners who were either scratching, erasing, or using "Wite Out" was very high. Scratching, erasing, or using Wite out on entry errors is not recommended because of the legal implications. Errors not easily seen or read cast doubt or suspicion on the reliability and credibility of the record and the one doing the charting.⁶³

Research Question Two

Are infection control procedures used to reduce the risk of disease transmission? Data revealed that the majority (79%) of dental practitioners are following the American Dental Association's ⁵⁵ and the Centers for Disease Control's^{13,55} recommendation to wear protective eyewear in the treatment of every patient. The data further revealed that orthodontists are least likely to wear protective eyewear in the treatment of every patient. Perhaps orthodontists consider their risks of cross infection reduced because they do not perform invasive procedures.

The majority (65.3%) of dental practitioners are complying with the American Dental Association's⁵⁵ and the Centers for Disease Control's^{12,55} recommendations to wear face masks or face shields and gloves during the treatment of every patient. Orthodontists and practitioners 50 years

and older were least likely to wear face masks and gloves in the treatment of every patient. Again, orthodontists may not perceive themselves at great risk because of the non-invasive procedures that they perform. Practitioners 50 years and older may not have exposed themselves to the current literature or recommendations on the utilization of face masks and gloves, or perhaps, they do not consider themselves at risk because of their familiarity with their long time patients.

The majority (80.2%) of dental practitioners are complying with the recommendation to change gloves with every patient and/or once every hour. The data further revealed that orthodontists are least likely to change their gloves with every patients, possibly because orthodontists are least likely to wear gloves. The federal government has classified gloves as disposable items; therefore, they should be discarded after one use. Additionally, because prolonged use of gloves increases the defect rate, they should be changed after one hour of use or when they become tacky.^{13,50}

The current handwashing recommendation is to wash with an antimicrobial soap before each patient, prior to gloving, and after removing the gloves.^{13,50} The data indicated that the majority of practitioners are subscribing to this routine. Data support the fact that many practitioners might improve their handwashing techniques by attending a

risk management seminar or a continuing education course on infection control protocols. Practitioners who are 50 years and older or have practiced 25 years or more might be encouraged to assess their current handwashing routine and institute improvements where possible.

Data on the number of dental personnel who have the hepatitis B vaccine indicated that most dental personnel might need to review the current recommendation. Currently, the risk management recommendation supported by the Centers for Disease Control¹³ is to have all dental personnel receive the hepatitis B vaccine. Data indicated that dentists and dental assistants have the vaccine; however, the number of dental hygienists and dental receptionists who have the vaccine is very low (12.4%). Non-percutaneous exposures, such as paper cuts, scratches, or dermatitis on the exposed skin of dental personnel, can provide vascular access of blood or serum and have been reported as modes of disease transmission.^{1,41} Considering these recommendations and the number of dental personnel who are not vaccinated, it might be prudent for all dental personnel to receive the hepatitis B vaccine.

The results indicated that the majority of dental practitioners are not following the recommended instrument cleaning procedure prior to sterilization, which is first, soaking the instruments; second, giving the instruments a preliminary scrubbing by hand, and then placing instruments

in the ultrasonic cleaner. Most dental practitioners (45.4%) are scrubbing the instruments prior to sterilization; however, a smaller percentage are soaking (25.1%) and ultrasonically cleaning (27.9%) the instruments. Runnells⁵⁰ suggests soaking the instruments in a phenol solution diluted with cool water to reduce the microorganisms prior to dental personnel handling the instrument. Scrubbing is no longer the method of choice because of the possibility of self inflicted wounds. Current recommendations are to use an instrument cassette that can be immersed into an ultrasonic cleaning unit so that personnel do not have direct contact with contaminated instruments. Data further revealed that dental practitioners who have practiced 25 years or more and are from small size practices are not subscribing to the recommendation of ultrasonically cleaning the dental instruments. Possibly, older practicing dentists have not been exposed to the technique of ultrasonic cleaning, and consequently, might not be appraised of the benefits. Perhaps, practitioners from small practices do not use the ultrasonic cleaner because it is less economical to run a small practice and investment in new equipment is limited. These practitioners might benefit from a risk management seminar or a continuing education course on infection control protocols.

Data indicated that dental practitioners are not following the recommendation of wearing heavy duty gloves

(e.g. Playtex gloves) when handling and scrubbing dental instruments. Many just use examination gloves when scrubbing the instruments. While not the majority, the percentage (12.6%) who do not use any gloves is high. Dental personnel are assuming a risk by wearing examination gloves, and an even greater risk by wearing no gloves at all when handling contaminated instruments. The American Dental Association⁵⁵ and the Centers for Disease Control^{13,55} recommend the use of heavy duty gloves, not examination gloves, to protect hands from the risk of cutting or puncturing. Further analysis revealed that periodontists display the best risk management techniques by using heavy duty gloves in their practice to scrub dental instruments. Conversely, large size dental practices have the worst risk management practices by not wearing any gloves when scrubbing dental instruments. Possibly, larger practices are busier, discouraging the dental personnel from taking the time to put on heavy gloves when handling the instruments. A recommendation to these practices might be to attend a risk management seminar or a continuing education course on infection control procedures. It is important to mention that the data confirm the benefits of attending a risk management seminar in regards to using heavy duty gloves.

The data revealed that many dental practitioners are following the recommendation of packaging instruments prior to sterilization; however, the percentage of practitioners

who are not packaging instruments is very high (30.8%). Sterilizing and keeping the dental instruments packaged reduces the chance of contamination by unsterilized instruments, aerosols, or microorganisms carried on the hands. Packaging instruments does have cost implications both in materials and in manpower which could explain why many practitioners elect not to package instruments. Practitioners who do not package the dental instruments might be encouraged to attend a course on infection control procedures.

Even though practitioners are using steam under pressure, dry heat, or chemical vapor to sterilize dental instruments, the number of practitioners using glutaraldehyde is very high (31.8%). Unfortunately, many practitioners use a glutaraldehyde to disinfect items that could be sterilized by steam, dry heat, or chemical vapor. Additionally, it is important to state that practitioners 50 years and older who have practiced 25 years or more are erroneously using quaternary ammonium compounds to sterilize dental instruments. Because these compounds are not recommended by the American Dental Association for sterilization of dental instruments, dental practitioners using such chemicals need to alter their method of sterilization. It is possible that dental practitioners, using glutaraldehyde or quaternary ammonium compounds, might not be aware that items being disinfected can be sterilized

via steam, dry heat, or chemical vapor. It also is possible that many practitioners might not know the difference between disinfection and sterilization. Furthermore, these dental practitioners might be deterred from implementing these recommendations due to cost and time, as well as, frustration from frequently changing recommendations. It could be very difficult for the average dentist to keep up with the rapid changes.

Data on the method used to monitor sterilization effectiveness indicated that dental practitioners might need to review the current procedures. Most dental practitioners use color change tape (58.8%), some use biological indicators, a few use dosage indicators, and many use none of the recommended procedures (20.1%). The current recommendation is to use color change indicators with each sterilization cycle and biological indicators at least once a week. Color change tape only indicates that the instruments were exposed to heat, dosage indicators verify that instruments were exposed to the correct sterilization time, but only the biological indicator confirms the sterilizer's effectiveness to destroy spores.^{13,55} It is possible that many practitioners might be unaware of these differences, or perhaps, they are aware but feel that it is unimportant, or economically unfeasible.

Item 33 indicates that the majority of dental practitioners might not be aware of the utilization of

surface disinfectants. Most of the respondents (29.4%) indicated that a glutaraldehyde is used primarily as a surface disinfectant; however, a glutaraldehyde is indicated for "cold sterilization" of instruments that cannot be sterilized. Additionally, the number of practitioners using alcohol, quaternary ammonium compounds, and soap and water as a surface disinfectant is very high (43.2%). These solutions have been proven ineffective in destroying the hepatitis B virus.⁵⁵ Periodontists, more than any other dental specialist, comply with the recommendation of using an iodophor as a surface disinfectant. Iodophors, phenol chemicals, and hypochlorites have been proven to be most effective in destroying the hepatitis B and AIDS virus.^{49,50} Possibly, dental practitioners are unable to keep up with the rapidly changing infection control recommendations.

The current recommendation is to discard all disposable items after one use with the exception of the face mask, which can be discarded less frequently. Data revealed that the majority of practitioners are not complying with this recommendation. Items more frequently discarded after one use are the patient napkins, saliva ejector, tray covers, hear rest covers, needles, and gloves; items less likely to be discarded after one use are face masks, prophylaxis brushes and rubber cups. Data further revealed that oral surgeons discard the saliva ejector less frequently than

periodontists. Possibly, oral surgeons do not use saliva ejectors during the procedures they perform; whereas, periodontists use the saliva ejector routinely. Also, oral surgeons do not use prophylaxis cups as frequently as other specialties, which would account for the high number of oral surgeons who indicated they do not discard prophylaxis cups. Perhaps, practitioners 50 years and older are unaware of the current standard of discarding prophylaxis brushes after one use. The prophylaxis cup and brush can harbor bacteria that escapes sterilization attempts. An explanation as to why orthodontists and practitioners who have practiced 25 years or more do not discard gloves after one use, might be that these practitioners are least likely to wear gloves, which is supported by the data from item 24. Orthodontists also are least likely to discard needles after one use; however, orthodontists seldom use needles on a routine basis. The explanation is unclear as to why practitioners 22-29 years of age are least likely to discard any of the disposable items. Perhaps, they are just starting out in practice and see the reuse of disposable items as a way of cutting operational costs. These practitioners might greatly benefit from an update on the current infection control standards, which is available in the current literature or from the American Dental Association,⁵⁵ Centers for Disease Control,^{13,14,15} and the Occupational Safety and Health Administration.

The recommended infection control procedures when treating patients with hepatitis B or AIDS include using a surgical gown for dental personnel and the patient; draping all possible equipment with surgical towels; using a face mask, safety glasses, and double surgical gloves; using as many disposable items as possible; and placing the gowns and all materials used in a separate bag marked "high risk". Data revealed that most practitioners are using gloves, masks, safety glasses, and disposable items when treating patients with hepatitis B or AIDS. Furthermore, data revealed that periodontists use surgical gowns for the dental personnel more frequently than general practitioners, possibly because they perform more invasive procedures than general practitioners. An explanation for large size practices draping the equipment more frequently than small practices might be because the chances of acquiring new knowledge is more likely. Also, data support the benefits of attending a risk management seminar to acquire this information. Practitioners 50 years and older might not wear safety glasses when treating high risk patients because they wear prescription glasses, or they might perceive their risk to be reduced due to their familiarity with their patients. Practitioners more likely to place items in a separate bag marked "high risk," had practiced between 2-4 years. Perhaps, these practitioners were exposed to this technique during dental school or their internships.

Orthodontists indicated they do none of the recommendations more frequently than any other dental specialty. It is possible that orthodontists might perceive their risk to be less because they do non-invasive procedures; however, an orthodontist is just as likely to see high risk patients as any other dental specialist, as well as, be exposed to these viruses carried through saliva. It might be prudent for these practitioners to update their current procedures so that they might be prepared when seeing high risk patients.

The majority of dental personnel are identifying high risk patients by some type of method, which is a good risk management practice. By coding or labeling high risk patient records, dental personnel can prepare themselves, the operator, and the patient to reduce the chances of disease transmission. It might behoove practitioners, not subscribing to this procedure, to incorporate the labeling or coding of high risk patient records into their practice, as well as, adopt the universal approach which is to treat everyone as if they were "high risk" patients by wearing gloves, masks, and safety glasses.

Research Question Three

Is an informed consent form presented to the patient prior to treatment?

The results indicated that dental practitioners are not addressing all the issues that constitute an informed consent. For the patient to be considered informed of

his/her present condition and/or prognosis, the following issues must be discussed with the patient. First, the patient should be told of his/her benefits of receiving the recommended service.^{38,46} Second, the patient must be appraised of the risks of receiving the recommended service.^{38,46} Third, the patients must be exposed to the alternatives to the recommended service.^{38,46} Fourth, the patient must be appraised of the risks of not receiving the recommended service.^{38,46} Lastly, the patient must know the costs of all recommended services.^{38,46} Data indicated that many practitioners are discussing the benefits and the alternatives to the recommended services; however, not as many are discussing the risks of receiving and not receiving the services, or the costs of the recommended services. Predominantly, practitioners who have practiced 25 years or more, are from small practices, and are 50 years and older are not following the recommended procedure for an informed consent. Possibly, these practitioners have not been exposed to these risk management techniques, or have never felt the need to incorporate them because their practice is established and their patients trust them. Data indicated that public health dentists discuss the cost of the recommended treatment less frequently than any other specialty. Perhaps, discussing the cost of the recommended service is not applicable to the practice of public health dentistry.

The best risk management practice is to have the dentist explain all the issues that constitute an informed consent. This assures that the selected services is understood by the patient, as well as the dentist, and allows that patient to ask questions about the procedures. Data indicated that the majority of dentists subscribe to this risk management practice. The data further revealed that dental hygienists from small offices explain the informed consent issues to the patient. Possibly, the dentist is too busy and it is easier to delegate this responsibility to the dental hygienist. The explanation as to why oral surgeons have the dental receptionist obtain the informed consent might be that many oral surgeons use health history forms which require a consenting signature, and that form is managed by the dental receptionist. It is important to note that the consenting signature does not guarantee that all the criteria of an informed consent have been met. Dental practitioners not subscribing to the recommendation of a complete informed consent might benefit from a risk management seminar. Additionally, it may behoove dental schools to stress the importance of the informed consent in the curricula.

Data indicated that 47.9% of dental practitioners are not utilizing written consent forms for dental treatment, or they use a general consent form (21.7%) agreeing to all services. Data further revealed that public health dentists

display the best risk management practices by obtaining written consent forms for most dental procedures. Public health dentists might be required to complete more forms and document more carefully than any other specialty because of state regulations for cost reimbursement. Periodontists used written consent forms for periodontal surgery, and oral surgeons use written consent forms for oral surgery more frequently than any other dental specialty, which are good risk management practices. Orthodontists did not use a written consent form for any of the listed dental procedures, but more likely use some other form. Consent to orthodontic treatment was not a selection from which the respondents had to choose, which is probably what orthodontists use. The recommendation to practitioners is to not use a general consent form agreeing to all services, because each dental procedure has a different risk, benefit, cost, and alternative; consequently, they cannot be generalized, and it could be argued legally that the patient signed a nebulous consent form.

Research Question Four

Are periodontally involved patients identified and classified?

To be considered a complete examination, the practitioner must chart all existing restorations, carious lesions, periodontal measurements, and gingival and periodontal assessments. The majority of practitioners are

recording all existing carious lesions, while a much smaller percentage are charting all existing restorations, periodontal pockets, and gingival and periodontal assessments. Furthermore, data indicated that orthodontists are not complying with many of the recommendations. The scope of orthodontic treatment might not include charting any of the aforementioned recommendations; however, it might be prudent for the orthodontist to record the gingival health of their patients because many patients exhibit gingival inflammation as a result of orthodontic banding. By charting the gingival assessment, the orthodontist might be able to compare existing with previous conditions which might be necessary to rule out iatrogenic factors in case of a lawsuit. The fact that periodontists specialize in obtaining and maintaining periodontal health, explains why periodontists chart all periodontal pockets. Practitioners 30-50 years and older might not be charting all periodontal pockets because it differs significantly from what they are accustomed to doing and what they were originally trained to do. Oral surgeons do not chart gingival and periodontal conditions, perhaps because many procedures rendered by oral surgeons are completed in one or two appointments.

Research Question Five

Are emergency protocols established to reduce the risk of patient injury or fatality?

The current risk management recommendation is to have a

completed medical emergency kit, with updated drugs, oxygen tanks, and an ambu bag in the dental office. Data suggested that dental practitioners might need to evaluate their current medical emergency equipment. The majority (51.3%) of respondents indicated that their medical emergency kit is comprised of bandaids, gauze, alcohol, oxygen tank, and an ambu bag, while a smaller percentage indicated they had drugs and/or prefilled syringes. Additionally, orthodontists do not have medical emergency kits in their offices. Possibly, orthodontists do not perceive themselves at risk of a medical emergency because of the non-invasive procedures they perform. Since the threat of a medical emergency can occur in their offices (e.g. insulin shock, diabetic coma, etc.), it might behoove orthodontists to acquire a medical emergency kit.

A good risk management practice is to qualify all dental personnel in CPR. This practice assures that quick and responsive action will be taken in the event of a cardiac or respiratory emergency. Data indicated that the majority (64.1%) of dental practices have only the dentist CPR certified. Many times dental personnel are alone with the patient, and they would be the first to react to a medical emergency; therefore, CPR training might greatly enhance the quality of care rendered to the patient.

A good medical emergency procedure should comprise designated people to call 911; retrieve the medical

emergency kit and oxygen tank; remain with the patient and take blood pressure measurements; perform CPR; and periodically rehearse the medical emergency procedures. Data indicated that most dental practitioners include calling 911 as a part of their medical emergency procedure; however, a small percentage of practitioners comply with the other medical emergency recommendations only. Data further revealed that periodontists and oral surgeons had better medical emergency procedures than the other dental specialties. Possibly, periodontists and oral surgeons have extensive training in the area of medical emergencies during dental school and their internships and realize the greater risks associated with treating people during surgical procedures. Also, because of the greater number of surgical procedures performed, anesthesia in and of itself elevates the risk of an emergency. Additionally, dental practitioners might benefit from attending a risk management seminar, which is supported by the data.

Research Question Six

Are office policies and procedures established and employed?

Data indicated that dental practitioners are not following the risk management recommendations of having an office policy manual in their practice. Office policy manuals provide essential information on specific policies and procedures that have been tailored to individual dental

practices. Data further revealed that practitioners between 40-49 years of age and who have practiced between 10 and 14 years had office policy manuals more frequently than other year groups. Possibly, over the years, these practitioners discovered the benefits of providing a new employee with a manual that describes in detail performance expectations and office protocols. Orthodontists and periodontists have office manuals more often than any other specialties, perhaps because these practices require a larger number of personnel making the need for a manual great. It is possible that large practices have office manuals more frequently than other size offices because it assures that all employees are provided with the same information. Data support that dental practitioners might greatly benefit from attending a risk management seminar. Furthermore, dental hygienists in the managerial role could be of assistance in the development of these manuals.

A good office manual should include several topics including: greeting new patients and scheduling appointments; schedule of services and time allotments; fees for services; handling paper work; emergency protocols; infection control procedures; and hiring and dismissal policies. The practitioners who have office manuals include greeting new patients; hiring and dismissal procedures; a schedule of services and fees; and a review of paperwork, while emergency protocols and infection control procedures

are not as frequently included. Periodontists include infection control protocols and hiring and dismissal procedures, while orthodontists include greeting of new patients as well as hiring and dismissal procedures in their office manuals more often than any other dental specialists. Possibly these practitioners are exposed to the contents of a complete office manual during their advanced studies.

A good risk management recommendation is to provide all new employees with a formal orientation to the practice to introduce employees to all the policies and procedures unique to the practice. For example, a new dental assistant would need to know where instruments are kept, infection control procedures, equipment operation, and documentation procedures. Data indicate that practitioners are subscribing to this risk management recommendation. Data further revealed that practitioners 50 years or older who had practiced for 25 years or more found a formal orientation not applicable to their practice. Possibly, these practitioners have had long time employees and have not had to hire new employees. Additionally, the data supports the benefits of attending a risk management seminar.

Data indicated that the dental practitioners are not following the risk management recommendation of using employment and termination contracts. Additionally, if contracts are used, the employment contract is used more

frequently. Possibly, over the years, dental practitioners 40-49 years of age have found employment contracts useful in delineating the employee expectations. Due to the fact that most public health dentists are government employees, employment contracts might be used on a regular basis to verify the applicants credentials and select the employee. Also, data indicated that large size practices use another type of contract other than employment or termination. If the practice employs more than 15 employees, the affirmative action, equal opportunity regulations required certain paperwork to be completed.

Dental practitioners are not following the recommendation of having their attorneys validate their employment and termination contracts; in fact, the majority indicated that the need to validate the contracts was not applicable to their practices. Attorney validation assures that statements on the contracts are not legally invalid. Public health dentists might have attorney validation of the contracts because they are government employees. Possibly, practitioners 40-49 years of age who have practiced 15-19 years do not receive attorney validation of their contracts because they have never been exposed to reasons or rationale, or they do not use contracts in their office settings.

Data revealed that the majority of respondents are following the regulations of having operable handicap ramps;

however, the percentage of respondents who do not have operable handicap ramps was high (42.3%). The federal government mandates that all public buildings and places of business must have operable handicap ramps. Data further revealed that pediatric dentists, dentists who have practiced one year or less, and practitioners from large practices indicated that handicap ramps were not applicable to their situations. If these practitioners are practicing in a building or place of business, it might be prudent of them to investigate the reasons why they do not have a ramp and make any changes to comply with this regulation. Additionally, with the increase in the elderly, practitioners might be able to increase their practices. Furthermore, these practitioners might greatly benefit from a risk management seminar, as supported by the data on item 49.

The risk management recommendation is to inspect all toys that are in the patient reception area for sharp and broken edges. The majority of dental practitioners found this recommendation not applicable to their practice; possibly because these practitioners do not have toys in their reception rooms. Additionally, the practitioners who do have toys in their reception rooms might find it prudent to inspect these items for sharp and broken edges to decrease the chance of patient injury.

The risk management recommendation is to periodically

inspect the parking lot for broken glass, nails, sharp objects, snow, and ice to reduce the chances of patient injury. The majority indicated they do inspect for these items which complies with the risk management recommendation. It might be prudent for practitioners to inspect their parking lots routinely to reduce the risk of patient injury.

CHAPTER 5

Summary and Conclusions

Risk management, quality assurance, and standard of care issues continue to evolve in the literature; however, to date, no studies have examined the degree to which dental professionals adhere to current recommendations. The major purpose of this investigation was to survey the current practice styles of Virginia dentists to determine compliance with the standards of risk management theory. Another objective of this investigation, although not measured, was to sensitize dental health care providers to risk management so that areas of legal vulnerability might be reduced within the dental practice setting. A determination of risk management strategies employed in dental practices within the Commonwealth of Virginia would assist practitioners in assessing their current strategies and in comparing their strategies to those recommended in the current literature.

After implementing a pilot study to establish content validity of the questionnaire, the risk management questionnaire was sent to 300 dental practices within the Commonwealth of Virginia. Data were obtained from 186 returned questionnaires (62%) and analyzed using frequency

and percentage of responses and a Chi-square goodness-of-fit test. Key variables analyzed included age of practitioner, years in practice, size of practice, dental specialty, and formal education on the principles of risk management. Results of this survey provided the following information concerning risk management strategies used by dentists:

1. Most dental practitioners are the original owners of their dental practices (69.4%). Most dental practitioners found the need to obtain a written consent from each patient granting access to his/her record not applicable to their situation (78.2%).

Most dental practitioners use ballpoint pens on the medical/dental history (79.9%) and the services rendered form (77.6%). The majority of practitioners have the patient and the dentist complete the medical/dental history (25.4%), while 17.2% have only the patient complete the medical/dental history form. Most practitioners review the medical/dental history prior to treatment (75.6%). Only 28.5% of the practitioners surveyed review both positive and negative responses on the medical/dental history form. Most practitioners have the patient sign the medical/dental history form after it has been reviewed (70.4%). Most practitioners (30.9%) update the medical/dental history form at every recall appointment.

When recording on services rendered, most practitioners make entries in chronological order, on consecutive lines

(94.1%). Most practitioners document in the services rendered record after performing the treatment (69%). Many dental practitioners enter the performed treatment that they rendered in the services rendered record (55.2%); some have the dental assistant enter the treatment in the services rendered record (31.2%). Many practitioners read and co-sign the documented services rendered by the dental assistant or dental hygienist (45.3%); however, almost an equal number do not read and co-sign the documented service (41.8%). The majority of practitioners found their documentation to be legible (95.9%) and retain all active patient records in their office (52.2%). Most dental practitioners do not require a recent blood test from hemophiliacs, blood transfused patients, renal dialysis patients, or leukemia patients to confirm negative results for AIDS and hepatitis B (56.6%); however, the practitioners who do require a blood test are pediatric dentists and dentists who have practiced one year or less. Few practitioners premedicate patients with organic heart murmurs (16.5%), functional heart murmurs (10.8%), full joint(s) replacement (14.4%), prosthetic cardiac valves (18.1%), rheumatic dysfunctions (17.5%), mitral valve prolapse (18%); however, very few premedicate patients with lupus erythematosus (3.2%). Furthermore, the practitioners less likely to premedicate full joint(s) replacement patients, prosthetic cardiac valves, rheumatic dysfunction

patients, and mitral valve prolapse patients are 50 years or older, and/or have practiced 25 years or more, and/or are from small practices, and/or have not attended a risk management seminar.

A small percentage of dental practitioners take blood pressure measurements only on patients reporting hypertension (22.9%). Two-thirds of the practitioners perform the intra- and extra-oral examination themselves (66.5%), while one-third have the dental hygienist perform the intra- and extra-oral examination (29.4%).

When correcting errors on the dental record, most practitioners draw a straight line through the error (61.5%), while some scratch through the error (12.9%), or use "Wite Out"^R on the error (10.1%).

2. The majority of practitioners wear safety glasses (79%), face masks (65.3%), and gloves (80.2%) during the treatment of every patient. Most practitioners change gloves with every patient (73.3%), but few washed their hands prior to gloving (25.2%).

The majority of practitioners have dental assistants who have received the hepatitis B vaccine (54.7%); periodontists are more likely to have dental receptionists who have had the hepatitis B vaccine than any other group of dentists.

Less than half of the practitioners scrub the dental instruments prior to sterilizing (45.4%), and use

examination gloves when scrubbing the instruments (39.6%). Also, the majority of periodontists use heavy duty gloves ($p = 0.0084$, $df = 2$) when scrubbing instruments. Less than half of the practitioners surveyed use autoclaving bags to package the dental instruments (47.3%). Furthermore, pediatric dentists are more likely than other dental specialists to package instruments, while large size practices are less likely to package dental instruments prior to sterilization than other size practices.

The sterilization method used by half the practitioners is steam under pressure (50%). Some use glutaraldehyde to sterilize dental instruments (31.8%). The majority of dental practitioners use color change tape to monitor sterilization effectiveness (58.8%). Approximately one-third of the practitioners use glutaraldehyde as a surface disinfectant (29.4%), while most periodontists use an iodophor as a surface disinfectant ($p = 0.0539$, $df = 8$).

Few practitioners discard disposable items after one use (15%), e.g. face mask (3.2%), prophylaxis cups (8.7%), and prophylaxis brushes (7.5%). Only twenty percent of the practitioners use disposable items when treating high risk patients, while orthodontists are less inclined to use any of the procedures listed ($p = 0.0000$, $df = 8$). When identifying medically complex patients, half of the practitioners label the words "high risk" on the front of the dental record (50.5%).

3. Twenty point six percent of practitioners explain the benefits of receiving the recommended treatment, as well as the alternatives to the recommended procedure. About half of the practices have the dentist explain the risks, benefits, alternatives, and costs to the patient. Less than half of the practitioners fail to not use a written consent form for treatment (42.9%), while some use a general consent form agreeing to all treatment (21.7%).

4. Some practitioners chart carious lesions on new patients (31.4%). Also, periodontists chart all periodontal pocket readings ($p = 0.0001$, $df = 8$).

5. The majority of practitioners have emergency kits with bandaids, gauze, alcohol, oxygen tanks, and ambu bags (51.3%). Most practices have one dentist that is CPR certified (64.1%). The majority of practitioners call 911 as a part of their medical emergency procedure (24.1%); periodontists have a designated person to retrieve the medical emergency kit ($p = 0.0039$, $df = 3$) and perform CPR ($p = 0.0035$, $df = 8$); and oral surgeons have a designated person to retrieve the oxygen tank ($p = 0.0004$, $df = 8$) and remain with the patient to take blood pressure measurements ($p = 0.0425$, $df = 3$), as well as periodically rehearse their medical emergency procedure ($p = 0.0409$, $df = 3$).

6. Many dental practitioners have an office policy manual (52.4%), while the remainder do not (47.6%). Furthermore, orthodontists, periodontists, large size

practices, practitioners 40-49 years of age who have practiced 10-14 years, and practitioners who have attended a risk management seminar more frequently have policy manuals. Few practitioners (16.5%) include greeting of new patients and scheduling appointments in their office manuals, while some include a schedule of services and time allotments (13.9%), fee schedule for rendered services (12.9%) and a review of paperwork to be handled in the office (13.7%). Periodontists were more likely to include infection control protocols ($p = 0.0198$, $df = 8$) than any other specialist. Orthodontists, as well as periodontists, include hiring and dismissal procedures ($p = 0.0022$, $df = 8$). The majority of dental practitioners do not use employment or termination contracts (78%). Also, the majority found the need to have their contracts validated by an attorney not applicable to their situation (78.2%).

Most dental practitioners do have an operable handicap ramp to their building or office (57.1%), while some do not have an operable ramp (38.2%). The majority of practitioners found inspecting toys not applicable to their situation (67.1%). Some practitioners do inspect the parking lots and sidewalks for ice (19.4%), snow (19.2%), broken glass (18.4%), sharp objects (17.7%), and stray nails (17%).

Results suggest that a large degree of variation exists in the risk management practices of dentists in Virginia.

The following guidelines, if operationalized in practice, would enable dental practitioners to manage their risks and reduce their legal vulnerability:

1. Documentation techniques

- a. Acquire patients' written consent granting access to his/her dental record when a practitioner purchases a dental practice from another practitioner.
- b. Have the dentist sign the health/dental history after it has been reviewed with the patient.
- c. Co-sign any documentation that the auxiliary enters in the services rendered record.
- d. Retain all active and inactive records in the dental office.
- e. Ask patients about medical conditions that could put a person at risk to AIDS and hepatitis B.
- f. Premedicate patients with organic heart murmurs, full joint replacement(s), prosthetic cardiac valves, rheumatic dysfunctions, mitral valve prolapse, coronary bypass surgery within the past 6 months, and lupus erythematosus.
- g. Take blood pressure measurements at regular intervals (e.g. every appointment, every recall appointment, once a year).
- h. Have only the dental hygienist or dentist perform the intra- and extra-oral examination.

2. Infection control

- a. Wear safety glasses, face masks, and gloves in the treatment of every patient.
- b. Change examination gloves with every patient or once an hour.

- c. Wash hands with an antimicrobial soap prior to gloving and after removing gloves; use overgloves; never wash gloves.
 - d. Obtain the hepatitis B vaccine for all dental health personnel.
 - e. Soak, scrub, and ultrasonic clean the dental instruments prior to sterilization.
 - f. Use heavy duty gloves when scrubbing dental instruments.
 - g. Package dental instruments prior to sterilization, and leave packaged until use.
 - h. Only use steam under pressure, chemical vapor, and/or dry heat to sterilize dental instruments.
 - i. Use color change tape with every sterilization cycle and biological (spore) indicators once a month.
 - j. Use an iodophor or phenol as a surface disinfectant.
 - k. Discard all disposable items after one use.
 - l. When treating patients, use the universal approach to infection control procedures (e.g. use all disposable items, drape all equipment, dispose of all items that cannot be sterilized, etc.).
3. Informed consent
- a. Explain to the patient the benefits, alternatives, costs, risks of receiving and not receiving the recommended treatment.
 - b. Use a written consent form for each invasive procedure (e.g. crown and bridge, periodontal treatment, emergency treatment, etc.).
4. Periodontal classification
- a. Periodontally classify patients by recording all carious lesions, all existing restorations, all periodontal pocket readings, and record the gingival and periodontal assessments.

5. Emergency protocols

- a. Obtain or update the medical emergency kit which should include drugs and/or prefilled syringes, oxygen tank, and ambu bag.
- b. Certify all dental personnel in CPR.
- c. Establish a medical emergency procedure that is rehearsed periodically (e.g. designated person to call 911, designated person to retrieve medical emergency kit, designated person to retrieve oxygen tank, designated person remains with patient and takes blood pressure, designated person(s) perform CPR.

6. Office policies

- a. Maintain an office policy manual which includes such items as: greeting new patients, schedule of services and fees, emergency protocols, infection control procedures, hiring and dismissal procedures, and other office protocols.
- b. Use employment and termination contracts and have an attorney validate them.
- c. If toys are in the patient reception room, periodically inspect for sharp and broken edges.
- d. Periodically inspect the parking lot and sidewalks for broken glass, nails, sharp objects, snow, ice, etc.

Considering the results and limitations of this study, the following recommendations for future study are made:

1. Replicate this study in five years to determine if any significant changes have occurred in the risk management strategies followed by dental practitioners in the Commonwealth of Virginia.

2. Conduct a similar study using dental programs in the United States to determine their risk management

techniques.

3. Study the significance of excluding the "check all that apply" which appears after many items in the questionnaire to identify the likelihood of practitioners giving socially acceptable responses.

This study suggests that dental practitioners in Virginia are practicing some of the recommended risk management techniques. However, in several areas discrepancies exist between what is recommended and what is being practiced. From the discrepancies, the following conclusions can be made:

1. Dental practitioners could improve their documentation techniques when reviewing and recording the dental record. Specifically, by documenting with only an ink pen; reviewing both positive and negative health history responses; signing the health history after reviewing it with the patient; documenting after services have been rendered; reading and co-signing services documented by auxiliaries; retaining both active and inactive patient records; premedicating patients with organic heart murmurs, full joint replacements, prosthetic cardiac valves, rheumatic dysfunctions, mitral valve prolapse, coronary bypass surgery within 6 months, and lupus erythematosus; taking and recording blood pressure measurements at regular intervals (e.g. one year and up); not allowing dental assistants to perform intra- and extra-oral examination; and

by not scratching, erasing, or using Wite Out on entry errors.

2. Dental practitioners could improve their infection control procedures by adhering to universal infection control: wearing gloves, face masks, and safety glasses in the treatment of every patient; frequently changing gloves; handwashing before, during, and after treating patients; using barriers on the dental unit; having all dental personnel receive the hepatitis B vaccine; following the recommended instrument handling procedures; only using phenols, iodophors, or hypochlorites as a surface disinfectant; not using cold disinfectants as a sterilization method; using biological indicators; and by disposing of all disposable items.

3. According to the results, an informed consent to care is not presented to patients prior to treatment, because all five components are not discussed. Specifically, the risks of receiving and not receiving the recommended treatment and the cost of the recommended services. Additionally, dental practitioners should utilize written informed consent forms for invasive procedures and complicated treatment plans (e.g. crowns and bridges, orthodontic treatment).

4. Periodontally involved patients are not identified and classified as frequently as those with carious lesions. Dental practitioners can identify and classify periodontal

patients by charting all periodontal pockets at the initial appointment and then following up with these periodontal readings at subsequent appointments.

5. Emergency protocols have not been established within dental practices in Virginia. Dental practitioners could improve their emergency protocols by obtaining a current medical emergency kit, certifying dental personnel in CPR, and by establishing an emergency procedure.

6. Dental practitioners could improve their office policies and procedures by producing a more comprehensive office manual (e.g. include infection control, hiring and dismissal procedures, fee schedules, greeting procedures, etc.), using attorney validated employment and termination contracts, and providing an operable handicap ramp.

7. Findings also suggest substantial variations in risk management practices among dental specialties, age groups, years in practice, size of the dental practice, and dentists who attended a risk management seminar. Generally, periodontists, practitioners between 30-39 years of age, those who have practiced between 2-10 years, and practitioners who have attended a risk management seminar comply with more risk management practices than the other respective groups.

8. Dental practitioners need to review their current risk management techniques, compare these to recently recommended techniques, and whenever possible, institute

improvements.

In conclusion, this study suggests that dental practitioners are practicing some of the recommended risk management techniques; however, in several areas discrepancies exist between what is recommended and what is being practiced. Dental practitioners need to review their current risk management techniques, compare these to recently recommended techniques, and whenever possible, institute improvements. Furthermore, this study could provide dental practitioners a basis from which they could compare and improve specific areas of their risk management program.

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APPENDICES

APPENDIX A
Risk Management Questionnaire

RISK MANAGEMENT QUESTIONNAIRE

INSTRUCTIONS: Please answer all the questions by placing a check [✓] in the appropriate boxes. Thank you for your time and participation.

Medical Record And Documentation Techniques

1. Are you the original owner of the practice to which this questionnaire has been sent?
☐ YES (go to item #3)
☐ NO
2. If you purchased the practice from another practitioner, did you receive a written consent from each patient stating that you had access to his/her dental records?
☐ YES
☐ NO
3. Which of the following recording devices are used when documenting on the Medical/Dental History Form? (check all that apply)
☐ Ball point pen
☐ Felt tip pen
☐ Pencil
☐ Other _____
4. Which of the following recording devices are used when documenting on the Services Rendered Record? (check all that apply)
☐ Ball point pen
☐ Felt tip pen
☐ Pencil
☐ Other _____
5. Which of the following individuals complete the Medical/Dental History Form? (check all that apply)
☐ Patient only
☐ Dentist only
☐ Patient and Dentist
☐ Guardian/Parent only
☐ Dental assistant
☐ Dental receptionist
☐ Dental hygienist
☐ Dental personnel only when patient is not able to complete the form
☐ Other _____
6. When is the Medical/Dental History Form reviewed? (check all that apply)
☐ Prior to treatment
☐ During the treatment
☐ After the treatment
☐ Other _____
7. Which of the following responses are reviewed with the patient? (check all that apply)
☐ Only positive responses
☐ Only negative responses
☐ Both negative and positive responses
☐ Other _____
8. Who signs the Medical/Dental History Form after it has been reviewed? (check all that apply)
☐ Patient
☐ Doctor
☐ Dental assistant
☐ Dental hygienist
☐ Dental receptionist
9. When is the Medical and/or Dental History Form updated? (check all that apply)
☐ At each appointment
☐ Every recall appointment
☐ Once a year
☐ Once every 3 years
☐ Never
☐ Other _____
10. Is each entry on the Services Rendered Record in chronological order, on consecutive lines?
☐ YES
☐ NO
11. When are the performed services documented in the Services Rendered Record? (check all that apply)
☐ Prior to treatment
☐ During treatment
☐ After treatment
☐ Other _____
12. Who enters the services that you performed on the Services Rendered Record? (check all that apply)
☐ Dentist
☐ Dental assistant
☐ Dental receptionist
☐ Other _____
13. Do you read and co-sign the documented services rendered by the dental hygienist or dental assistant in your office?
☐ YES
☐ NO
14. Are the documented entries in the dental record legible?
☐ YES
☐ NO
15. Which patient records do you retain in your office? (check all that apply)
☐ All active patients
☐ All inactive patients
☐ Other _____
16. Are any of the following questions asked in some manner on your Medical History Form? (check all that apply)
☐ Have you ever had a blood transfusion?
☐ Have you ever had a history of hepatitis?
☐ Have you ever had renal dialysis?
☐ Do you have joint(s) replacement/implants?
☐ Do you have acquired immune deficiency syndrome (AIDS)?
☐ Do you have leukemia or hemophilia?
☐ Have you ever been treated for a drug-related problem?
☐ When was the last time you had your blood tested?
☐ Have you ever been out of the United States?

17. From which of the following patients do you require a recent blood test to confirm negative results for AIDS or Hepatitis B? (check all that apply)
- ☐ Hemophiliacs
 - ☐ Blood transfused patients
 - ☐ Renal dialysis patients
 - ☐ Leukemia patients
 - ☐ None of the above
 - ☐ Other _____
18. For which of the following conditions do you premedicate patients? (check all that apply)
- ☐ Organic heart murmur
 - ☐ Functional heart murmur
 - ☐ Full joint replacements
 - ☐ Prosthetic cardiac valves
 - ☐ Rheumatic dysfunctions
 - ☐ Mitral valve prolapse
 - ☐ Lupus Erythematosus
 - ☐ Other _____
19. When are blood pressure measurements taken in your office? (check all that apply)
- ☐ Only patients reporting high blood pressure
 - ☐ Only patients reporting cardiac conditions
 - ☐ At every recall appointment
 - ☐ At every appointment
 - ☐ Once a year
 - ☐ Starting at 12-yr-old and up
 - ☐ Starting at 20-yr-old and up
 - ☐ Starting at 40-yr-old and up
 - ☐ During certain procedures as a monitoring device: What procedures? _____
 - ☐ Never
 - ☐ Other _____
20. Who performs the intra- and extra-oral examinations? (check all that apply)
- ☐ Dentist(s)
 - ☐ Dental hygienist
 - ☐ Dental assistant
 - ☐ Other _____
21. How do you correct errors on the dental record? (check all that apply)
- ☐ Erase from dental record
 - ☐ Scratch out errors
 - ☐ Use "white out" on errors
 - ☐ Draw a straight line through the errors
 - ☐ Do not remove from record
 - ☐ Other _____
22. In which of the following situations do you wear safety glasses? (check the one that applies)
- ☐ In the treatment of every patient
 - ☐ When the Medical/Dental History indicates the need
 - ☐ Do not wear safety glasses
23. In which of the following situations do you wear face masks? (check the one that applies)
- ☐ In the treatment of every patient
 - ☐ When the Medical/Dental History indicates the need
 - ☐ Do not wear face masks
24. In which of the following situations do you wear gloves? (check the one that applies)
- ☐ In the treatment of every patient
 - ☐ When the Medical/Dental History indicates the need
 - ☐ Do not wear gloves (go to item #26)
25. How frequently do you change gloves? (check all that apply)
- ☐ Every patient
 - ☐ Once every hour
 - ☐ Only when the Medical/Dental History indicates the need
 - ☐ Use one set in a.m., one set in p.m.
 - ☐ Never
 - ☐ Other _____
26. Which of the following situations describes your handwashing routine? (check all that apply)
- ☐ Prior to gloving
 - ☐ Before each patient
 - ☐ Between each patient
 - ☐ After each patient
 - ☐ After removing the gloves
 - ☐ Other _____
27. Who in your office has had the Hepatitis B vaccine? (check all that apply)
- ☐ Dentist(s) # _____
 - ☐ Dental assistant(s) # _____
 - ☐ Dental hygienist(s) # _____
 - ☐ Dental receptionist(s) # _____
 - ☐ No one in the office
28. Prior to instrument sterilization which of the following techniques are used? (check all that apply)
- ☐ Scrubbing
 - ☐ Ultrasonic cleaning
 - ☐ Soaking
 - ☐ None of the above
 - ☐ Other _____
29. If your office personnel scrub the instruments prior to sterilization, do they wear any of the following? (check the one most frequently worn)
- ☐ Examination gloves
 - ☐ Surgical gloves
 - ☐ Heavy duty gloves (e.g., Platex® gloves)
 - ☐ Do not scrub instruments
 - ☐ No gloves
 - ☐ Other _____
30. Prior to sterilization, how are the instruments packaged? (check any that apply)
- ☐ Autoclave bags
 - ☐ Paper towels
 - ☐ Muslin bags
 - ☐ Cloth towels
 - ☐ Not packaged
 - ☐ Other _____
31. Which of the following techniques are used to sterilize your instruments? (check all that apply)
- ☐ Dry heat
 - ☐ Steam under pressure (e.g., autoclave)
 - ☐ Chemical vapor (e.g., Chemclave®)
 - ☐ Glutaraldehyde (e.g., Cidex®)
 - ☐ Quaternary ammonium compounds
 - ☐ Other _____

INFECTION CONTROL

22. In which of the following situations do you wear safety glasses? (check the one that applies)
- ☐ In the treatment of every patient
 - ☐ When the Medical/Dental History indicates the need
 - ☐ Do not wear safety glasses
23. In which of the following situations do you wear face masks? (check the one that applies)
- ☐ In the treatment of every patient
 - ☐ When the Medical/Dental History indicates the need
 - ☐ Do not wear face masks
31. Which of the following techniques are used to sterilize your instruments? (check all that apply)
- ☐ Dry heat
 - ☐ Steam under pressure (e.g., autoclave)
 - ☐ Chemical vapor (e.g., Chemclave®)
 - ☐ Glutaraldehyde (e.g., Cidex®)
 - ☐ Quaternary ammonium compounds
 - ☐ Other _____

32. Which of the following do you use to monitor sterilization effectiveness? (check all that apply)

☐ Color change tape
☐ Dosage indicator
☐ Biological indicator
☐ None of the above
☐ Other _____

33. Which of the following surface disinfectants are *primarily* used in your office? (check any that are primarily used)

☐ Glutaraldehyde (e.g., Cidex®)
☐ Quaternary ammonium compounds
☐ Hypochlorites (bleach)
☐ Alcohol
☐ Iodophors (e.g., Biocide®)
☐ Phenols (e.g., Multicide®)
☐ Soap and Water
☐ None of the above
☐ Other _____

34. Which of the following disposable items are discarded after *one* use? (check all that apply)

☐ Saliva ejectors
☐ Rubber cups
☐ Prophyl brushes
☐ Head rest covers
☐ Tray covers
☐ Patient napkins
☐ Rubber exam gloves
☐ Face masks
☐ Needles
☐ None of the above
☐ Other _____

35. Are any of the following procedures used for high risk patients (patient with hepatitis B, a carrier of hepatitis B, or AIDS patient)? (check any that apply)

☐ Use of a surgical gown for patient
☐ Use of a surgical gown for dental personnel
☐ Draping of all possible equipment (i.e., dental chair and stool, lamp handles, handpieces, etc.)
☐ Use of face masks
☐ Use of safety glasses
☐ Use of disposable items
☐ Disposing of any items that cannot be sterilized (i.e., burs, needles, etc.)
☐ Placing gowns and materials used to drape equipment, disposable items, gloves, and masks in a separate bag marked high risk
☐ None of the above
☐ Other _____

36. How are high risk patients identified in your practice? (check all that apply)

☐ Color coded stickers on the record
☐ Label with words on front of the record
☐ Not identified on the record
☐ Other _____

INFORMED CONSENT

37. Which of the following issues do you explain to the patient regarding the services you recommend? (check

all that apply)

☐ The benefits of receiving the recommended service
☐ The risks of receiving the recommended service
☐ The alternatives to the recommended service
☐ The risks of *not* receiving the recommended service
☐ The cost of the recommended service
☐ None of the above
☐ Other _____

38. Who in your office explains all the aforementioned issues to the patient? (check any that apply)

☐ Dentist
☐ Dental assistant
☐ Dental hygienist
☐ Dental receptionist
☐ Office manager
☐ Other _____

39. For which of the following services do you utilize a written consent form? (check all that apply)

☐ General consent form agreeing to all services (i.e., scaling/root planing prophylaxis, etc.)
☐ Restorations
☐ Emergencies
☐ Oral surgery
☐ Periodontal surgery
☐ Prosthetic appliances
☐ None of the above
☐ Other _____

PERIODONTAL CLASSIFICATION

40. Which of the following procedures are completed on new patients? (check all that apply)

☐ Chart existing restorations
☐ Chart carious lesions
☐ Chart periodontal probe measurements for all pocket readings
☐ Chart periodontal probe measurements above 4mm.
☐ Chart periodontal and gingival assessments

EMERGENCY PROTOCOLS

41. What does your medical emergency kit include? (check all that apply)

☐ Band aids, gauze, alcohol, oxygen tank, ambu bag
☐ Drugs and/or prefilled syringes
☐ None of the above

42. Who in your office is currently CPR certified? (check all that apply)

☐ Dentist(s) # _____
☐ Dental assistant(s) # _____
☐ Dental hygienist(s) # _____
☐ Dental receptionist(s) # _____
☐ None of the above
☐ Other _____

43. Which of the following comprise your medical emergency procedures? (check all that apply)
- ☐ Designated person calls 911
 - ☐ Designated person retrieves medical emergency kit
 - ☐ Designated person retrieves oxygen tank
 - ☐ Designated person remains with patient and takes BP
 - ☐ Designated person performs CPR
 - ☐ Periodic rehearsal of medical emergency procedure
 - ☐ None of the above
 - ☐ Other _____

OFFICE POLICIES

44. Do you have a policy manual for your dental office?
- ☐ YES
 - ☐ NO
45. What topics does your office manual include? (check all that apply)
- ☐ Greeting new patients and scheduling appointments
 - ☐ Schedule of services and time allotments
 - ☐ Fees for services
 - ☐ Handling paper work (i.e., medical/dental histories, periodontal assessments, informed consent, etc.)
 - ☐ Emergency protocols
 - ☐ Infection control procedures
 - ☐ Hiring and dismissal policies
 - ☐ Do not have an office manual
 - ☐ Other _____
46. Do you provide a formal orientation for new office personnel?
- ☐ YES
 - ☐ NO
47. Are any of the following contracts used in your office? (check all that apply)
- ☐ Employment contracts
 - ☐ Termination contracts
 - ☐ None of the above (go to item #49)
 - ☐ Other _____
48. If you have employment and termination contracts, have you had your attorney validate them?
- ☐ YES
 - ☐ NO
49. Do you have an operable handicap ramp to your building or office?
- ☐ YES
 - ☐ NO

50. If you have toys in your patient reception room, are they periodically inspected for sharp and broken edges?
- ☐ YES
 - ☐ NO
 - ☐ Not applicable
51. Do you periodically inspect the parking lot and sidewalks around your office building for...?
- ☐ Broken glass
 - ☐ Nails
 - ☐ Sharp objects
 - ☐ Snow
 - ☐ Ice
 - ☐ None of the above
 - ☐ Other _____

DEMOGRAPHICS

1. Please indicate your age to the nearest birthday.
- | | |
|--------------------------------------|--|
| <input type="checkbox"/> 22-29 years | <input type="checkbox"/> 40-49 years |
| <input type="checkbox"/> 30-39 years | <input type="checkbox"/> 50 years or older |
2. Please indicate the number of years in practice.
- ☐ 1 year or less
 - ☐ 2-4 years
 - ☐ 5-9 years
 - ☐ 10-14 years
 - ☐ 15-19 years
 - ☐ 20-24 years
 - ☐ 25 years or more
3. Please indicate your dental specialty.
- ☐ Endodontist
 - ☐ General Practitioner
 - ☐ Oral and Maxillofacial Surgeon
 - ☐ Oral Pathologist
 - ☐ Orthodontist
 - ☐ Pediatric Dentist
 - ☐ Periodontist
 - ☐ Prosthodontist
 - ☐ Public Health Dentist
4. Please indicate the number of employees in your office.
- Dentist(s) # _____
- Dental assistant(s) # _____
- Dental hygienist(s) # _____
- Dental receptionist(s) # _____
5. Have you ever attended a risk management seminar?
- ☐ YES
 - ☐ NO

THANK YOU for your time and participation in this study!
If you are interested in the results of the survey, they will be made available upon request.

Please return to:
Joanne Schade Boyce, R.D.H., B.S.
Old Dominion University
College of Health Sciences
School of Dental Hygiene
Norfolk, VA 23529-0499



OLD DOMINION UNIVERSITY

Old Dominion University is an affirmative action, equal opportunity institution.
3-1016 1/88

APPENDIX B
Cover Letter - Initial Mailing

OLD DOMINION UNIVERSITY

College of Health Sciences
Norfolk, Virginia 23529-0499

February 3, 1988



Office of the Dean
803-440-4960

Office of
Continuing
Education
440-4256

School of
Community
Health
Professions and
Physical
Therapy
440-4409

Community
Health
Education
440-4410

Environmental
Health
440-3611

Ophthalmic
Technology
461-0050

Physical Therapy
440-4519

School of Dental
Hygiene and
Dental Assisting
440-4310

School of Medical
Technology
440-3589

School of Nursing
440-4297

Clinical Practice
Center
440-4960

Dear Doctor:

The enclosed questionnaire is part of a research study designed to survey the current risk management techniques used on dental practices within Virginia. Little research has been performed in the area of dental risk management. This survey will provide data that dental practitioners could use to improve their dental risk management techniques to reduce the risk of dental litigation.

The questionnaire can be answered in 15 minutes. Please respond to every item honestly and completely.

For your convenience, a pre-addressed stamped envelope is enclosed. Please return your questionnaire by February 19, 1988. After you have returned your questionnaire, please complete and return the postcard separately to insure your anonymity.

All responses will remain confidential and will be reported in group form only. You may obtain the results of the study by checking the appropriate space on the return postcard.

In appreciation for your participation in the study, an information packet on the standards of risk management will be sent to you upon submission of your questionnaire.

Thank you for your cooperation and prompt participation.

Sincerely,

Joanne Schade Boyce, CDA, RDH, BS
Master's Degree Candidate
School of Dental Hygiene

APPENDIX C

Cover Letter - Second Mailing

OLD DOMINION UNIVERSITY

College of Health Sciences
Norfolk, Virginia 23529-0499

March 14, 1988



Office of the Dean
804-440-4960

Office of
Continuing
Education
440-4256

School of
Community
Health
Professions and
Physical
Therapy
440-4409

Community
Health
Education
440-4410

Environmental
Health
440-3611

Ophthalmic
Technology
461-0050

Physical Therapy
440-4519

School of Dental
Hygiene and
Dental Assisting
440-4310

School of Medical
Technology
440-3589

School of Nursing
440-4297

Clinical Practice
Center
440-4960

Dear Doctor:

Recently you were sent a questionnaire concerning the current risk management techniques used in dental practices within Virginia. I have not yet received your response to the questionnaire. In order for this survey to be representative of the population it is important that I receive as many responses as possible. This study is a graduate research project which I am conducting to obtain data that dental practitioners could use to improve their dental risk management techniques and reduce dental litigation.

For your convenience, a second questionnaire, return envelope, and postcard are enclosed. If you have not yet completed the questionnaire, please complete and return by March 28, 1988.

If you have returned the questionnaire and not the blue postcard, please complete and return as soon as possible.

All responses will remain confidential and will be reported in group form only. You may obtain the results of the study by checking the appropriate space on the return postcard.

Thank you for your cooperation and participation.

Sincerely,

Joanne Schade Boyce, CDA, RDH, BS
Master's Degree Candidate
School of Dental Hygiene

APPENDIX D
Completed Questionnaire Post Card

Joanne Schade Boyce, RDH, BS
Graduate Student
School of Dental Hygiene
College of Health Sciences
Old Dominion University
Norfolk, VA 23529-0499

I have completed and mailed the questionnaire
on "Risk Management."

NAME: _____

ADDRESS _____

() Please send me the results of the research.

() I am interested in a risk management
assessment of my dental office.

PHONE: _____

THANK YOU FOR YOUR PARTICIPATION!

APPENDIX E

Summary of Responses to Risk Management Questionnaire

Appendix E

Medical Record and Documentation Technique

Item 1. Are you the original owner of the practice to which this questionnaire has been sent?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
YES	118	69.4	69.4	69.4
NO	48	28.2	28.2	97.6
Not Applicable	4	2.4	2.4	100.0

(N=170; valid cases = 170; missing cases = 0)

Item 2. If you purchased the practice from another practitioner, did you receive a written consent from each patient stating that you had access to his/her dental records?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
0	2	1.2	1.2	1.2
YES	2	1.2	1.2	1.2
NO	33	19.4	19.4	20.6
Not Applicable	133	78.2	78.2	100.0

(N=170; valid cases = 170; missing cases = 0)

Item 3. Which of the following recording devices are used when documenting on the Medical/Dental History Form?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Ball point pen	163	79.9	79.9	79.9
Felt tip pen	27	13.2	13.2	93.1
Pencil	11	5.4	5.4	98.5
Other	3	1.5	1.5	100.0

(N=170; valid cases = 167; missing cases = 3)

Item 4. Which of the following recording devices are used when documenting on the Services Rendered Record?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Ball point pen	163	77.6	77.6	77.6
Felt tip pen	29	13.8	13.8	91.4
Pencil	13	6.2	6.2	97.6
Other	5	2.4	2.4	100.0

(N=170; valid cases = 168; missing cases = 2)

Item 5. Which of the following individuals complete the Medical/Dental History Form?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Patient only	67	17.2	17.2	17.2
Dentist only	15	3.8	3.8	21.0
Patient & Dentist	99	25.4	25.4	46.4
Guardian/Parent Only	51	13.1	13.1	59.5
Dental Assistant	35	9.0	9.0	68.5
Dental Receptionist	30	7.7	7.7	76.2
Dental Hygienist	28	7.2	7.2	83.4
Dental Personnel only	61	15.6	15.6	99.0
when patient is not able to complete form				
Other	4	1.0	1.0	100.0

(N=170; valid cases = 170; missing cases = 0)

Item 6. When is the Medical/Dental History reviewed?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Prior to treatment	167	75.6	75.6	75.6
During the treatment	36	16.3	16.3	91.9
After the treatment	15	6.8	6.8	98.7
Other	3	1.4	1.4	100.0

(N=170; valid cases = 170; missing cases = 0)

Item 7. Which of the following responses are reviewed with the patient?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Only positive responses	49	28.5	28.5	28.5
Only negative responses	12	7.0	7.0	35.7
Both negative and positive responses	104	60.5	60.5	96.2
Other	7	4.1	4.1	100.0

(N=170; valid cases = 167; missing cases = 3)

Item 8. Who signs the Medical/Dental History Form after it has been reviewed?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Patient	131	70.4	70.4	70.4
Dentist	49	26.3	26.3	96.7
Dental Assistant	2	1.1	1.1	97.8
Dental Hygienist	4	2.2	2.2	100.0
Dental Receptionist	0	0	0	100.0

(N=170; valid cases = 154; missing cases = 16)

Item 9. When is the Medical and/or Dental History Form updated?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
At each appointment	36	19.3	19.3	19.3
Every recall appointment	69	36.9	36.9	56.2
Once a year	47	25.1	25.1	81.3
Once every 3 years	17	9.1	9.1	90.4
Never	3	1.6	1.6	92.0
Other	15	8.0	8.0	100.0

(N=170; valid cases = 166; missing cases = 4)

Item 10. Is each entry on the Services Rendered Record in chronological order on consecutive lines?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
0	3	1.8	1.8	1.8
YES	160	94.1	94.1	95.9
NO	6	3.5	3.5	99.4
Not applicable	1	.6	.6	100.0

(N=170; valid cases = 170; missing cases = 0)

Item 11. When are the performed services documented in the Services Rendered Record?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Prior to treatment	17	7.4	7.4	7.4
During the treatment	51	22.3	22.3	29.7
After the treatment	158	69.0	69.0	98.7
Other	3	1.3	1.3	100.0

(N=170; valid cases = 169; missing cases = 1)

Item 12. Who enters the services that you performed on the Services Rendered Record?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Dentist	154	55.2	55.2	55.2
Dental Assistant	87	31.2	31.2	86.4
Dental Receptionist	22	7.9	7.9	94.3
Other	16	5.7	5.7	100.0

(N=170; valid cases = 168; missing cases = 2)

Item 13. Do you read and co-sign the documented services rendered by the dental hygienist or dental assistant in your office?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
0	2	1.2	1.2	1.2
Yes	77	45.3	45.3	46.5
No	71	41.8	41.8	88.2
Not Applicable	20	11.8	11.8	100.0

(N=170; valid cases = 170; missing cases = 0)

- - - - -

Item 14. Are the documented entries in the dental record legible?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Yes	163	95.9	95.9	95.9
No	4	2.4	2.4	98.2
No Applicable	3	1.8	1.8	100.0

(N=170; valid cases = 170; missing cases = 0)

- - - - -

Item 15. Which patient records do you retain in your office?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
All active patients	165	52.2	52.2	52.2
All inactive patients	141	44.6	44.6	96.8
Other	10	3.2	3.2	100.0

(N=170; valid cases = 169; missing cases = 1)

- - - - -

Item 16. Are any of the following questions asked in some manner on your Medical History Form?

- A. Have you ever had a blood transfusion?
- B. Have you ever had a history of hepatitis?
- C. Have you ever had renal dialysis?
- D. Do you have joint(s) replacement/implants?
- E. Do you have acquired immune deficiency syndrome (AIDS)?
- F. Do you have leukemia or hemophilia?
- G. Have you ever been treated for a drug-related problem?
- H. When was the last time you had your blood tested?
- I. Have you ever been out of the United States?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
A.	60	10.5	10.5	10.5
B.	155	27.0	27.0	37.5
C.	64	11.1	11.1	48.6
D.	69	12.0	12.0	60.6
E.	64	11.1	11.1	71.7
F.	100	17.4	17.4	89.1
G.	46	8.0	8.0	97.1
H.	12	2.1	2.1	99.2
I.	4	0.7	0.7	100.0

(N=170; valid cases = 159; missing cases = 11)

Item 17. From which of the following patients do you require a recent blood test to confirm negative results for AIDS or Hepatitis B?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Hemophiliacs	28	13.2	13.2	13.2
Blood-transfused patients	21	9.9	9.9	23.1
Renal dialysis patients	20	9.4	9.4	32.5
Leukemia patients	15	7.1	7.1	39.6
None of the above	120	56.6	56.6	96.2
Other	8	3.8	3.8	100.0

(N=170; valid cases = 157; missing cases = 13)

Item 18. For which of the following conditions do you premedicate patients?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Organic heart murmur	128	16.5	16.5	16.5
Functional heart murmur	84	10.8	10.8	27.3
Full joint replacement	112	14.4	14.4	41.7
Pros. cardiac valves	141	18.1	18.1	59.8
Rheumatic dysfunctions	136	17.5	17.5	77.3
Mitral valve prolapse	140	18.0	18.0	95.3
Lupus Erythematosus	25	3.2	3.2	98.5
Other	12	1.5	1.5	100.0

(N=170; valid cases = 163; missing cases = 7)

Item 19. When are blood pressure measurements taken in your office?

- A. Only patients reporting high blood pressure.
- B. Only patients reporting cardiac conditions.
- C. At every recall appointment.
- D. At every appointment.
- E. Once a year.
- F. Starting at 12-year-old and up
- G. Starting at 20-years-old and up.
- H. Starting at 40-years-old and up.
- I. During certain procedures as a monitoring device: What procedure?
- J. Never
- K. Other

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
A.	62	22.9	22.9	22.9
B.	33	12.2	12.2	35.1
C.	29	10.7	10.7	45.8
D.	10	3.7	3.7	49.5
E.	9	3.3	3.3	52.8
F.	2	0.7	0.7	53.5
G.	16	5.9	5.9	59.4
H.	3	1.1	1.1	60.5
I.	46	17.0	17.0	77.5
J.	35	12.9	12.9	90.4
K.	26	9.6	9.6	100.0

(N=170; valid cases = 163; missing cases = 7)

Item 20. Who performs the intra-oral and extra-oral examinations?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Dentist(s)	165	66.5	66.5	66.5
Dental Hygienist	73	29.4	29.4	95.9
Dental Assistant	8	3.2	3.2	99.8
Others	2	0.8	0.8	100.0

(N=170; valid cases = 167; missing cases = 3)

Item 21. How do you correct errors on the dental record?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Erase from dental record	11	5.3	5.3	5.3
Scratch out errors	25	12.0	12.0	17.3
Use "White out" on errors	21	10.1	10.1	27.4
Draw a straight line through the errors	128	61.5	61.5	88.9
Do not remove from record	18	8.7	8.7	97.6
Other	5	2.4	2.4	100.0

(N=170; valid cases = 167; missing cases = 3)

Item 22. In which of the following situations do you generally wear safety glasses?

- A. In the treatment of every patient.
- B. When the Medical/Dental History indicates the need.
- C. Do not wear safety glasses.

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
A.	132	79.0	79.0	79.0
B.	18	10.8	10.8	89.8
C.	17	10.2	10.2	100.0

(N=170; valid cases = 164; missing cases = 6)

Item 23. In which of the following situations do you wear face masks?

- A. In the treatment of every patient.
- B. When the Medical/Dental History indicates the need.
- C. Do not wear face masks.

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
A.	111	65.3	65.3	65.3
B.	38	22.4	22.4	87.7
C.	21	12.4	12.4	100.0

(N=170; valid cases = 167; missing cases = 3)

Item 24. In which of the following situations do you wear gloves?

- A. In the treatment of every patient.
- B. When the Medical/Dental History indicates the need.
- C. Do not wear gloves.

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
A.	134	80.2	80.2	80.2
B.	24	14.4	14.4	94.6
C.	9	5.4	5.4	100.0

(N=170; valid cases = 167; missing cases = 3)

Item 25. How frequently do you change gloves?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Every patient	126	73.3	73.3	73.3
Once every hour	15	8.7	8.7	82.0
Only when the Medical/ Dental History indicates the need	10	5.8	5.8	87.8
Use one set in a.m.; one set in p.m.	4	2.3	2.3	90.1
Never	0	0	0	90.1
Other	17	9.9	9.9	100.0

(N=170; valid cases = 160; missing cases = 10)

Item 26. Which of the following situations describes your handwashing routine?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Prior to gloving	135	25.2	25.2	25.2
Before each patient	104	19.4	19.4	44.6
Between each patient	74	13.8	13.8	58.4
After each patient	102	19.1	19.1	77.5
After removing gloves	116	21.7	21.7	99.2
Other	4	0.7	0.7	100.0

(N=170; valid cases = 168; missing cases = 2)

Item 27. Who in your office has had the Hepatitis B vaccine?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Dentist(s)	55	32.4	32.4	32.4
Dental assistant(s)	93	54.7	54.7	87.1
Dental hygienist(s)	18	10.6	10.6	97.6
Dental receptionist(s)	3	1.8	1.8	99.4
No one in the office	1	0.6	0.6	100.0

(N=170; valid cases = 170; missing cases = 0)

Item 28. Prior to instrument sterilization, which of the following techniques are used?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Scrubbing	154	45.4	45.4	45.4
Ultrasonic cleaning	94	27.7	27.7	73.1
Soaking	85	25.1	25.1	98.2
None of the above	2	0.6	0.6	98.8
Other	4	1.2	1.2	100.0

(N=170; valid cases = 166; missing cases = 4)

Item 29. If your office personnel scrub the instruments prior to sterilization, do they wear any of the following?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Examination gloves	72	39.6	39.6	39.6
Surgical gloves	21	11.5	11.5	51.1
Heavy duty gloves, (eg, Playtex? gloves)	56	30.8	30.8	81.9
Do not scrub instruments		4	2.2	2.2
84.1				
No gloves	23	12.6	12.6	96.7
Other	6	3.3	3.3	100.0

(N=170; valid cases = 165 missing cases = 5)

Item 30. Prior to sterilization, how are the instruments packaged?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Autoclave bags	106	47.3	47.3	47.3
Paper towels	16	7.1	7.1	54.4
Muslin bags	7	3.1	3.1	57.5
Cloth towels	22	9.8	9.8	67.3
Not packaged	69	30.8	30.8	98.1
Other	4	1.8	1.8	100.0

(N=170; valid cases = 167; missing cases = 3)

Item 31. Which of the following techniques are used to sterilize your instruments?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Dry heat	24	8.4	8.4	8.4
Steam under pressure	143	50.0	50.0	58.4
Chemical vapor	15	5.2	5.2	63.6
Glutaraldehyde	91	31.8	31.8	95.4
Quaternary ammonium compounds	9	3.1	3.1	98.5
Other	4	1.4	1.4	100.0

(N=170; valid cases = 168; missing cases = 2)

Item 32. Which of the following do you use to monitor sterilization effectiveness?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Color change tape	114	58.8	58.8	58.8
Dosage indicator	5	2.6	2.6	61.4
Biological indicator	29	14.9	14.9	76.3
None of the above	39	20.1	20.1	96.4
Other	7	3.6	3.6	100.0

(N=170; valid cases = 164; missing cases = 6)

Item 33. Which of the following surface disinfectants are primarily used in your office?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Glutaraldehyde	105	29.4	29.4	29.4
Quaternary ammonium compounds	11	3.1	3.1	32.5
Hypochlorites	44	12.3	12.3	44.8
Alcohol	93	26.1	26.1	70.9
Iodophors	40	11.2	11.2	82.1
Phenols	14	3.9	3.9	86.0
Soap and water	41	11.5	11.5	97.5
None of the above	0	0	0	97.5
Other	9	2.5	2.5	100.0

(N=170; valid cases = 164; missing cases = 6)

Item 34. Which of the following disposable items are discarded after one use?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Saliva ejectors	143	13.0	13.0	13.0
Rubber cups	95	8.7	8.7	21.7
Prophy brushes	82	7.5	7.5	29.2
Head rest covers	124	11.3	11.3	40.5
Tray covers	151	13.8	13.8	54.3
Patient napkins	166	15.1	15.1	69.4
Rubber exam gloves	136	12.4	12.4	81.8
Face masks	35	3.3	3.3	85.1
Needles	163	14.8	14.8	99.9
None of the above	2	0.2	0.2	100.1
Other	1	0.1	0.1	100.2

(N=170; valid cases = 168; missing cases = 2)

Item 35. Are any of the following procedures used for high risk patients?

- A. Use of a surgical gown for patient.
- B. Use of a surgical gown for dental personnel.
- C. Draping of all possible equipment.
- D. Use of face masks.
- E. Use of safety glasses.
- F. Use of disposable items.
- G. Disposing of any items that cannot be sterilized.
- H. Placing gowns and materials used to drape equipment, disposable items, gloves, and masks in a separate bag marked high risk.
- I. None of the above
- J. Other

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
A.	14	2.1	2.1	2.1
B.	29	4.3	4.3	6.4
C.	40	5.9	5.9	12.3
D.	136	20.0	20.0	32.3
E.	133	19.6	19.6	51.9
F.	138	20.3	20.3	72.2
G.	131	19.3	19.3	91.5
H.	41	6.0	6.0	97.5
I.	5	0.7	0.7	98.2
J.	13	1.9	1.9	100.0

(N=170; valid cases = 157; missing cases = 3)

Item 36. How are high risk patients identified in your practice?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Color-coded stickers on the record	59	31.7	31.7	31.7
Label with words on front of the record	94	50.5	50.5	82.2
Not identified	13	7.0	7.0	89.2
Other	20	10.8	10.8	100.0

(N=170; valid cases = 160; missing cases = 10)

Item 37. Which of the following issues do you explain to the patient regarding the services you recommend?

- A. The benefits of receiving the recommended service.
- B. The risks of receiving the recommended service.
- C. The alternatives to the recommended service.
- D. The risks of not receiving the recommended service.
- E. The cost of the recommended service.
- F. None of the above
- G. Other

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
A.	156	20.6	20.6	20.6
B.	141	18.6	18.6	39.2
C.	156	20.6	20.6	59.8
D.	149	19.7	19.7	79.5
E.	149	19.7	19.7	99.2
F.	5	0.7	0.7	99.9
G.	2	0./3	0.3	100.2

(N=170; valid cases = 166; missing cases = 4)

Item 38. Who in your office explains all the aforementioned issues to the patient?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Dentist	165	51.1	51.1	51.1
Dental assistant	47	14.6	14.6	65.7
Dental hygienist	55	17.0	17.0	82.7
Dental receptionist	32	9.9	9.9	92.6
Office manager	24	7.4	7.4	100.0
Other	0	0	0	100.0

(N=170; valid cases = 165; missing cases = 5)

Item 39. For which of the following services do you utilize a written consent form?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
General consent form agreeing to all services	43	21.7	21.7	21.7
Restorations	3	1.5	1.5	23.2
Emergencies	7	3.5	3.5	26.7
Oral surgery	26	13.1	13.1	39.8
Periodontal surgery	9	4.5	4.5	44.3
Prosthetic appliances	8	4.0	4.0	48.3
None of the above	85	42.9	42.9	91.2
Other	17	8.6	8.6	100.0

(N=170; valid cases = 162; missing cases = 8)

PERIODONTAL CLASSIFICATIONS

Item 40. Which of the following procedures are completed on new patients?

- A. Chart existing restorations.
- B. Chart carious lesions
- C. Chart periodontal probe measurements for all pocket readings.
- D. Chart periodontal probe measurements above 4 mm.
- E. Chart periodontal and gingival assessment.

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
A.	91	19.4	19.4	19.4
B.	147	31.4	31.4	50.8
C.	49	10.5	10.5	61.3
D.	85	18.2	18.2	79.5
E.	96	20.5	20.5	100.0

(N=170; valid cases = 157; missing cases = 13)

EMERGENCY PROTOCOLS

Item 41. What does your medical emergency kit include?

- A. Band-aids, gauze, alcohol, oxygen tank, ambu bag.
- B. Drugs and/or prefilled syringes.
- C. None of the above

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
A.	135	51.3	51.3	51.3
B.	111	42.2	42.2	93.5
C.	17	6.5	6.5	100.0

(N=170; valid cases = 166; missing cases = 4)

Item 42. Who in your office is currently CPR certified?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Dentist				
Dental assistant				
Dental hygienist				
Dental receptionist				
None of the above				
Other				

(N=170; valid cases = ; missing cases =)

Item 43. Which of the following comprise your medical emergency procedure?

- A. Designated person calls 911.
- B. Designated person retrieves medical emergency kit.
- C. Designated person retrieves oxygen tank.
- D. Designated person remains with patient and takes blood pressure.
- E. Designated person performs CPR.
- F. Periodic rehearsal of medical emergency procedure.
- G. None of the above
- H. Other

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
A.	103	24.1	24.1	24.1
B.	61	14.3	14.3	38.4
C.	64	15.0	15.0	53.4
D.	54	12.6	12.6	66.0
E.	60	14.0	14.0	80.0
F.	32	7.5	7.5	87.5
G.	47	11.0	11.0	98.5
H.	7	1.6	1.6	100.0

(N=170; valid cases = 164; missing cases = 6)

Item 44. Do you have a policy manual for your dental office?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Yes	89	52.4	52.4	52.4
No	80	47.1	47.1	99.4
Not applicable	1	0.6	0.6	100.0

(N=170; valid cases = 170; missing cases = 0)

Item 45. What topics does your office manual include?

- A. Greeting new patients and scheduling appointments.
- B. Schedule of services and time allotment.
- C. Fees for service.
- D. Handling paper work.
- E. Emergency protocols.
- F. Infection control procedures.
- G. Hiring and dismissal policies.
- H. Do not have an office manual.
- I. Other

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
A.	65	16.5	16.5	16.5
B.	55	13.9	13.9	30.4
C.	51	12.9	12.9	43.3
D.	54	13.7	13.7	57.0
E.	36	9.1	9.1	66.1
F.	41	10.4	10.4	76.5
G.	60	15.2	15.2	91.7
H.	28	7.1	7.1	98.8
I.	5	1.3	1.3	100.0

(N=170; valid cases = 113; missing cases = 57)

Item 46. Do you provide a formal orientation for new office personnel?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Yes	97	57.1	57.1	57.1
No	62	36.5	36.5	93.6
Not applicable	8	4.7	4.7	98.3
Other	3	1.8	1.8	100.0

(N=170; valid cases = 170; missing cases = 0)

Item 47. Are any of the following contracts used in your office?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Employment contracts	22	13.8	13.8	13.8
Termination contracts	9	5.7	5.7	19.5
None of the above	124	78.0	78.0	97.5
Other	4	2.5	2.5	100.0

(N=170; valid cases = 151; missing cases = 19)

Item 48. If you have employment and termination contracts, have you had your attorney validate them?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Yes	8	4.7	4.7	4.7
No	27	15.9	15.9	20.6
Not applicable	133	78.2	78.2	98.8
Other	2	1.2	1.2	100.0

(N=170; valid cases = 170; missing cases = 0)

Item 49. Do you have an operable handicap ramp to your building or office?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Yes	97	57.1	57.1	57.1
No	65	38.2	38.2	95.3
Not applicable	7	4.1	4.1	99.6
Other	1	0.6	0.6	100.0

(N=170; valid cases = 170; missing cases = 0)

Item 50. If you have toys in your patient reception room, are they periodically inspected for sharp and broken edges?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Yes	38	22.4	22.4	22.4
No	17	10.0	10.0	32.4
Not applicable	114	67.1	67.1	99.4
Other	1	0.6	0.6	100.0

(N=170; valid cases = 170; missing cases = 0)

Item 51. Do you periodically inspect the parking lot and sidewalks around your office building for...?

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>	<u>Cumulative Percent</u>
Broken glass	106	18.4	18.4	18.4
Nails	98	17.0	17.0	35.4
Sharp objects	102	17.7	17.7	53.1
Snow	111	19.2	19.2	72.3
Ice	112	19.4	19.4	91.7
None of the above	34	5.9	5.9	97.6
Other	14	2.4	2.4	100.0

(N=170; valid cases = 161; missing cases = 9)
